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A COMPARISON OF THE EFFECTS OF CONCEPTUAL TRAINING AND TUTORING ON THE ACADEMIC SKILLS OF DISADVANTAGED CHILDREN.

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A COMPARISON OF THE EFFECTS OF CONCEPTUAL TRAINING
AND TUTORING ON THE ACADEMIC SKILLS
OF DISADVANTAGED CHILDREN

by

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M.A., University of Windsor, 1967

A Dissertation
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ABSTRACT

The present study investigated the effects of conceptual training and tutoring on the academic skills of disadvantaged children.

It was predicted that disadvantaged adolescents who were given conceptual training would improve their verbal reasoning and academic skills. It was also predicted that Ss given academic tutoring would improve their academic skills, but not their conceptual skills, more than untutored Ss and that untutored Ss would not improve either their academic or conceptual skills.

The Ss were 30 Juvenile Court wards between the ages of 11 and 17, who were referred for tutoring because of their poor school performance. They were randomly divided up into three groups. One group was given conceptual training, another was tutored in academic skills and the third was not included in the program. Tests were given to Ss prior to and following the 12 week, 2 hour a week, tutoring program. The tests were: Digit Span subtest of the WISC; word meaning, paragraph meaning, arithmetic concept tests from the primary battery of the Stanford Achievement Test; verbal battery, form 1, level A of the Lorge-Thorndike Intelligence Test; and the Raven's Progressive Matrices. School grades attendance, citizenship ratings and days of Youth Home

incarceration were also collected for each S.

The results indicated that the group given conceptual training had improved their academic skills on the Stanford Achievement Test significantly more ($p < .05$) than the other two groups. Although there were trends suggesting that their school and community adjustment had also improved, their school grades had not improved significantly more than the other two groups. Neither had their conceptual abilities. The untutored group had made no significant improvements on any of the measures and the group tutored in academic skills had not improved their academic or conceptual skills significantly more than the untutored group.

It was concluded that conceptual training alone had improved academic skills. Possible reasons why these improved skills did not lead to improved grades in school and to improved performances on tests measuring conceptual skill were discussed.

PREFACE

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CHAPTER I

INTRODUCTION

Clinicians working with disadvantaged adolescents frequently find themselves struggling with low motivation and inadequate academic skills. Help cannot be found in the schools since educators have had very little success in improving the academic and intellectual skills of disadvantaged children. In fact, Californian statistics show that the child from a disadvantaged background has traditionally achieved at the rate of .7 of a year for every year of instruction. This means that the disadvantaged child falls further and further behind, at the rate of three months for every school year. At the end of the third grade, he is already a full year behind the middle-class student and when he enters his teenage years, he is two years behind and about to become a drop out (Riles, 1970).

Three main explanations of this situation have been advanced. 1. The disadvantaged child's ability to learn may be genetically limited. 2. The disadvantaged child's pre-school experiences may provide him with inadequate learning skills. 3. The disadvantaged child's learning skills may be adequate, but his teachers may not be motivating him to learn. The purpose of this paper was to review the relevant literature, to propose certain hypotheses on how to improve the disadvantaged

adolescent's academic skills based on the second and third assumptions, and to test out these hypotheses.

The Genetic Explanation

The heredist holds that the genetic endowment of a child from a disadvantaged home is responsible for his low intelligence and lack of academic success.

There has been a lot of comment over the fairness of testing poor and minority-group children with IQ items devised by middle-class whites. Many have claimed that intelligence tests are unfair to the culturally deprived child because they emphasize verbal ability rather than the mechanical and social kinds of abilities in which lower-class children excel, and because the middle-class environment stresses the development of verbal intelligence more than the lower-class environment (Ausubel, 1967). Yet, even if these tests are culturally unfair they may be valid predictors of culturally, unfair, but nevertheless, highly important criteria that determine such things as academic achievement and job performance (Anastasi, 1968; Baughman, 1971; Fishman, et al., 1967). What makes these traditional intelligence tests really unfair is that they are unlikely to reflect the disadvantaged child's intellectual potential. Deprived children have few test-taking skills, are less responsive to speed pressure, are less motivated in taking tests, have less rapport with the examiner and are less familiar with the specific vocabulary and tasks that make up the content of the tests than

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are their middle-class age-mates (Ausubel, 1967; Fishman, et al., 1967; Kennedy, Van de Riet, and White, 1963; Reissman, 1962; Rosenthal and Jacobson, 1968). These factors lower predictive validity because their influence is restricted to the test and, unlike the cultural factors, do not influence the criterion behavior. (Anastasi, 1968).

Examiner rapport and motivation have come under specific scrutiny by various researchers. Reissman (1962) reported a study done by Haggard (1954) which demonstrated that when disadvantaged children were tested by examiners trained to be responsive to deprived children and offered special rewards for doing well, the IQ's of these disadvantaged children improved sharply and improved more than their middle-class age-mates given the same advantages. Douvan (1956) showed that when the test situation promised rewards that were direct, immediate, practical, and meaningful, deprived children responded at a higher level than when such rewards were absent. This was less true with middle-class youth, who were more often motivated to perform at close to their maximum level even while rewards were absent. Zigler and de Labry (1962) also found that lower-class children performed more effectively on a concept-switching task when a tangible rather than an intangible reinforcer was employed. On the other hand, middle-class children performed more effectively under an intangible rather than tangible reinforcement condition. Furthermore, although middle-class children performed more effectively than lower-class children in

the intangible reinforcement condition, there was no difference in concept-switching when each group received what was for that group the preferred reinforcer. These authors have noted that being "right" is primarily a middle-class phenomenon and that this particular intangible reinforcer is more frequently paired with other primary and secondary reinforcers in the middle-class than it is in lower-class populations.

Other researchers have demonstrated the importance of instructions, practice items, and reading ability. Under nonspecific instructions superior intelligence was associated with more effective concept attainment on all measures of performance, but under explicit instructions, Ss of average intelligence improved while those of superior intelligence remained unchanged (Osler and Weiss, 1962). Haggard (1954) has found that practice on different types of test problems improves the performance of disadvantaged children more than their middle-class age-mates given the same advantage. Haggard (1954) has also shown that deprived children do better when test items are read aloud to them while they follow along in their test books. Thus, offering tangible rewards, explaining the rules, and increasing the confidence of the disadvantaged child is likely to result in test performances which are better reflections of his intellectual potential.

In addition to the above factors reducing test validity, there are the problems of complex criteria and the effects of intervening events. Anastasi (1968) stressed the

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fact that if we want to use tests to predict an outcome in some future situation, such as an applicant's performance in college or on a job, we need tests with high predictive validity against the specific criterion. In this regard, she introduced the concept of test bias: the overprediction or underprediction of criterion measures. For example, if a test consistently underpredicts criterion performance for a given group, it shows unfair discrimination or bias against this group. Anastasi (1968) went on to report that several studies with college admission tests have thus far yielded no evidence that such tests are biased against students with culturally disadvantaged backgrounds. In fact, the studies she reported showed the opposite; that the tests were more likely to underpredict the criterion performance of students from the professional group and whites, and overpredict the criterion performance of students from lower socioeconomic levels and blacks.

On the other hand, Bernstein (1960) found such a bias when he compared the verbal and nonverbal abilities of lower-class and middle-class 15 to 18 year old Englishmen. The language scores of the lower-class group, as measured by the Mill-Hill Vocabulary Score, were depressed in relation to the scores at the higher ranges of the Raven's Progressive Matrices and this relationship was not found in the middle-class group. Jensen (1970) has praised the Raven's for its reliability and its ability to spot those children with potentially strong academic aptitude. Therefore, the Mill-Hill

Vocabulary Test may be biased against those lower-class Englishmen who want to further their education.

Even if the test is not biased, the test may be attempting to predict measures of performance that are the result of bias. Fishman, et al., (1967) reminded those interested in predictive validity that criterion performance is the result of many complex factors. For instance, school grades are likely to reflect motivation, classroom behavior, personal appearance, ethnic background and study habits as well as intelligence and achievement. In this regard, Fishman et al., (1967) quoted DeHaan and Kough (1956) who had been working with minority group children of above average ability or talent in the North Central Association Project on Guidance and Motivation of Superior and Talented Secondary School Students:

They learn rapidly, but not necessarily those lessons assigned in school. They reason soundly, think clearly, recognize relationships, comprehend meanings, and may or may not come to conclusions expected by the teacher. They are able to influence others to work toward desirable or undesirable goals.

Thus, it is difficult to measure the intelligence of a disadvantaged child and predict his academic potential. He is not prepared to take tests developed and administered by and for an alien culture, even if these tests were not biased against him (about which there is some question) and even if they were not trying to predict measures of performance that were also likely to be biased against him. According to Zimiles (1970), tests are best suited to the

measurement of stored information, perceptual and visual motor skills, and the ability to follow simple instructions. They identify outcomes of previous formal or informal learning and offer an index of the visible skills and levels of knowledge which have been achieved at the time of testing.

The Learning Theory Explanation

Jensen (1970), a leading proponent of the genetic position, has reported research on the learning abilities of disadvantaged children that shows that their strength exists in their ~~fundamental~~ ability to learn, whether they are of high or low general intelligence. Although there were highly reliable individual differences there were no significant differences in the distribution of scores as a function of social class or race on learning tasks involving memory span, serial learning, paired-associate learning, trial and error selection learning and free recall of certain kinds of informational input.

It would appear reasonable from the above to conclude that test performance is the result of motivation and the opportunity to acquire academic knowledge and skills. Since the opportunity can hardly be of a genetic origin, then the geneticists are left with motivation. Hayes (1962) actually proposed that the innate intellectual potential consists of tendencies to engage in activities conducive to learning. However, he claimed that the correlation between adult IQ and that determined at three years of age or less is for all

practical purposes negligible. If adult IQ is the product of 15 or 20 years of learning, it can be best predicted at three years of age by a forecast of learning activity during the next 15 years, rather than an assessment of what had been learned in the past three years. This proposal has received support from those who believe that qualities such as curiosity, competitive striving, and need for achievement are related to increases in IQ, academic success, and occupational competency (Kagan, Sontag, Baker, and Nelson, 1958; McClelland, 1973). These same qualities which would facilitate the acquisition of skills would also mitigate the need for tangible rewards, explicit instructions, and coaching to motivate test performance. These proposals and observations are naturally speculative and not within the experimental domain of this paper. However, they do raise the question of whether intrinsic motivation is of genetic origin and whether or not extrinsic motivation can replace it in motivating the learning of academic skills.

Be that as it may, Jensen (1970) contended that learning abilities are necessary but not sufficient for the development of the more complex levels involving symbolic or abstract thinking, conceptual learning, semantic generalization, and use of language as a tool of thought in learning and problem solving. Certainly, the experimental evidence has supported the view that paired-associate learning and concept identification involve quite different processes. Kirtsch (1970) concluded that the difference lay in that a single item

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pair must be taken as the unit of analysis in paired-associate learning, but that a whole class of equivalent items is the appropriate unit for concept learning. The major difference, then, between conceptual and rote learning is the difference between categorizing and "chunking". The latter consists of grouping items together because they are experienced together temporarily or spatially, the former, because they share common attributes (Nolan, 1973).

Glasser (1973) explained that appropriately designed structures for learning can reduce the amount of information that must be held in mind to comprehend the subject matter. For example, a verbal label, a conceptual formulation, a formula, or a principle can help to organize and summarize a large number of observations. Some ways of remembering may permit better memory retrieval than other ways, and, as a result the capacities of the learner can be extended by facilitating retention, thus allowing for thinking and problem solving. Good pedagogical structures can also facilitate the learner's capacity to generate new information or learn new things on the basis of what he has already learned. Thus, as Eisenberg (1967) had claimed, it may be necessary to improve the disadvantaged child's language and conceptual skills in order to improve his academic skills.

Jensen (1963) had already offered supporting evidence for this hypothesis when he taught a group of educationally retarded adolescents to use verbal mediation in a task which required the learning of a list of paired associates. These

Ss learned to construct a sentence around each pair of meaningful words. A control group of Ss from a similar background, who were not instructed in this use of verbal mediation took five times as long to learn the task. Likewise, kindergarten children and even ninth graders have been found to increase their amount of recall when they are forced to organize on a semantic base (Anglin, 1970).

According to Harlow (1949), each child must form a "learning set" in order to learn most efficiently. A "learning set" is an organizing mechanism of mental activity whose effectiveness is built up step by step by the solution of increasingly difficult problems. At each level the individual tries out various responses to solve each given task. Eventually the individual may organize simple learning sets into more complex patterns of learning sets. Harlow (1949) felt that this learning to learn, this transfer from problem to problem, which is called the formation of a learning set, is a highly predictable and orderly process. Harlow and Harlow (1949) also concluded from the research that the ability to solve problems without fumbling was not inborn, but was gradually acquired. Thinking does not develop spontaneously as an expression of innate abilities, but is the end product of a long learning process. The untrained brain can function by means of trial and error but only the trained brain can think in terms of ideas and concepts.

Dismissing his own research, Jensen (1970) disagreed with Harlow and asserted that the development of

complex mental abilities depends on the development of innate-neural structures. He based this allegation on the fact that performance on the best tests of these abilities is not affected by training. In other words, high resistance to practice gains strongly suggests that the test is getting more at internally regulated developmental processes than at environmental attainments. For instance, transfer of training is surprisingly small on the Raven's Progressive Matrices, even when there is high similarity between training items and the test items (Jensen, 1970). On the other hand, although stability is supposed to mean that the score reflects an innate aptitude that is unmodified by experience, it could also mean that the test is simply insensitive to important changes in what a person knows or can do (McClelland, 1973).

The basis for these conceptual test items can be found in such universal topological concepts as inside-outside, up-down, above-below, left-right, behind-infront, in-out, full-empty, and so forth. Add to these such elementary quantitative concepts as many-few, increase-decrease, small-large, etc. and one has virtually all the basic elements with which to make a Raven's Progressive Matrices, Cattell's Culture-Fair tests, and the Domino Test. These three tests generally show higher loadings of g when factor analyzed with other measures of intelligence, than any other tests. Thus, it is possible to measure general intelligence with a high degree of reliability simply by means of the elemental topological-quantitative properties (Jensen, 1970).

In his argument and conclusion, Jensen disregarded the questionable validity of the Stanford-Binet and Wechsler Intelligence Scales with which he was validating these tests of conceptual ability. It should also be noted that Jensen was using tests of elemental topological-quantitative properties to predict how well someone can organize and summarize observations, remember, think, problem solve, and generate new information on the basis of what he has already learned. Testing would have greater validity if fewer of the above assumptions were made and greater use were made of criterion sampling and operant as well as respondent behavior (McClelland, 1973).

Unfortunately, some educators have accepted Jensen's (1969, 1970) claim that the disadvantaged child lacks the ability to learn to use language for logical operations and as a means of inter-relating learning. It is assumed that the child tends to learn by rote and quickly forgets. To correct for these deficiencies Bereiter (1970) suggested that the entire school program should be designed so as to permit continual progress in learning without excessive demands on thinking ability.

In summary, the disadvantaged child is likely to have poorer language and conceptual skills than his middle-class age-mate. These skills may be necessary for academic success; however, the geneticist has yet to prove that these skills are gene determined without depending on intelligence

tests of questionable validity. Socially, the genetic hypothesis has encouraged educators to design school curricula that will not require the students to think. Belief in the genetic argument may relieve the guilt of the intelligent, but at what cost to the self-image and potential of the disadvantaged child. Because of the ultimately unanswerable and unprovable assertions of the genetic proponents, human beings are likely to suffer for generations.

The environmentalists argue that there can be no learning (except in trivial, autistic instances) without adequate teaching. One can categorically assert that if a child performs appropriately on an IQ item, he has been taught the skills needed to handle the item. It means that he has learned the words, the operations, and concepts that would allow him to handle that item or similar items dealing with the problem. The amount of teaching that has been required for two different children to achieve a particular criterion of performance on an IQ item may vary considerably. The performance on the item provides for no inference about the amount of teaching that has been provided; therefore, the item cannot be seriously considered as an indicator of the child's innate capacity to learn (Engelmann, 1970).

It follows that two children of equal genetic endowment, one growing up in a middle-class environment and the other growing up in a lower-class environment will not have equal opportunity for achieving academic success.

1 In fact, it is obvious from looking at the data on identical twins that individuals with exactly the same genetic constitution can differ widely on the phenotypic trait measured by IQ tests and interpreted to be their academic potential (Gottesman, 1968). Identical twins raised in different environments can show differences in intelligence test scores which are fully comparable to the differences found between racial groups (Albee, et.al., 1969). In addition, twins (identical or fraternal) have lower IQ's than nontwins. The origin cannot be genetic and is probably due to the decreased care which children can get from their parents where there are two of them instead of one of the same age (Cavalli-Sforza, 1970). This would be in agreement with the observation that the mean IQ decreases markedly with increasing sibship size.

Another observation that contributes to the environmentalist's position is that deprived children show a decrease in IQ and academic performance with advancing age (Baughman, 1971; Feldman and Weiner, 1960; Kennedy, Van de Riet, and White, 1963; Whiteman, Brown, and Deutsch, 1967; Zimiles, 1970). Furthermore, Feldman and Weiner (1960) found a tendency in the literature to indicate that most differences of psychological and psychomotor functions may be leveled off when social and economic variables are controlled. Although Whiteman, Brown, and Deutsch (1967) did not find that blacks performed equal to whites within the same socioeconomic group, they did find that when the amount of "significant deprivation" was controlled for, then the age decrement for blacks was

eliminated.

"Significant deprivation", according to Whiteman, Brown, and Deutsch (1967) is a group of six factors which they have labeled the Deprivation Index. This Index acts independently of socioeconomic status (the educational level and occupation of the main economic support of the family) and race in contributing to variation in test performance. Their results suggest that cumulations of specific environmental factors (e.g. parents having low educational aspirations for the child, an absence of kindergarten experience, no dinner conversations, and the child's lack of anticipation of cultural experiences for the coming weekend) can have a disadvantaging effect despite relatively high socioeconomic status and that the diminution of such factors may have an advantageous effect despite relatively low socioeconomic status.

Nevertheless, black children perform consistently lower than their peers on measures of verbal intelligence, even in the presence of controls on socioeconomic status and the Deprivation Index (Whiteman, Brown, and Deutsch, 1967). One explanation for this is that in addition to the disadvantaging factors associated with lower socioeconomic status, there may be deficits produced by environmental factors associated with being black (Baughman, 1971). Another explanation is that there is more disorganization in the black family and frequently the family unit is nonexistent (Cortés, and Gatti, 1972). Since it is likely that the disadvantaged

child's home is physically and psychologically disruptive, it follows that this will effect such factors as adult stimulation of his speech, adult regard for linguistic modes of expression, the opportunity to hear new words in a meaningful context, and the opportunity to discover the usefulness of developing a vocabulary that will satisfy one's needs and influence the social environment.

Brodbeck and Irwin (1946) illustrated the effects of social environment on vocalization in children as young as six months. An infant must be encouraged to emit sounds and this is less likely to happen in orphanages and large, lower-class families. Speech sounds function both as social responses and as social stimuli. The unpatterned speech of the infant is frequently a response to the behavior of the members of the family and in turn his speech sounds stimulate them to respond with culturally determined rewards and punishments. It is in these combined ways that infant speech acquires cultural meaning.

Several researchers (John, 1963; John and Goldstein, 1967; Milner, 1951; Pettigrew, 1964) have concluded that differences in language skills are clearly associated with social class and that when groups such as blacks move from a restrictive environment to a more stimulating one, their measured IQ will rise. Milner (1951) gave the California Test of Mental Maturity to all of the first grades in each of three elementary schools, each one of which served a different social class of blacks. He selected the 21 highest scorers

and the 21 lowest scorers, and gave both of them and their mothers questionnaires. The high scorers wished for toys and things to play with and/or a pet, expressed appreciation for the time their mothers spent in taking them places and reading to them, expressed strongly negative feelings about parental control and prohibition of their behavior and desires, indicated that they possessed several or a great many story books and indicated that they were habitually read to by their mothers and/or fathers. Low scorers, significantly more frequently than high scorers, could not think of a wish to make or could express only one, expressed strong negative feelings about physical punishment administered to them by their parents, either could not recall ever feeling "real happy" or were unable to describe or recall instances or situations when they felt happy, and indicated that they possessed only funny and/or school books. The mothers of low scorers (lower-class) indicated significantly more than mothers of high scorers (middle-class) that they do not eat breakfast with their children; that they do not talk with the children during breakfast or supper with the exception of giving direct orders, cautions, and instructions in a one-way communication fashion; that the children do not talk with anyone between the time they finish breakfast and the time they leave for school; and that neither they nor other related adult hug, or kiss, or speak approvingly to their children. The mothers of high scorers reported more often than mothers of low scorers that the whole family had

breakfast and supper together, that there was general conversation among family members, and that they or another adult hug, kiss, or speak approvingly to their children. It seems the lower-class child of this study lacks chiefly two things; a warm positive family atmosphere and an adult-relationship pattern which may be a motivational prerequisite for any kind of adult-controlled learning.

John (1963) and John and Goldstein (1967) also found consistent evidence of class differences in children's language skills; the ability to label, relate, and categorize. John and Goldstein (1967) observed that middle-class occupations generally require and permit verbal interaction with a variety of people. The individual must continually adjust his speech in terms of rate, intonation, vocabulary and grammatical complexity in an attempt to provide optimal communication. In contrast to this, the verbal interaction required in lower-class occupations is of a more routine, highly conventionalized nature. If a child learns by feedback, by being heard, corrected, and modified; and by imitation, he stands to learn more by interacting with an adult teacher who plays an active role in simplifying the various components of word-referent relationships.

These authors go on to explain that the acquisition of labels is the result of the interaction of two major variables; the stability of the word-referent relationship and the consistency with which the child's speech is

listened to, corrected, and modified. By the quality and amount of connective feedback he gives, the actively participating adult determines the breadth of the generalization and the precision of the discrimination the child relies upon while learning multiple referents. Generalizing a word from one setting to another required the discovery of the relevant variations which accompany the essential constancy. This process of discovering invariance common to multiple instances of a label is fundamental for the conceptual as well as verbal development of the young child.

Siller (1957) demonstrated with sixth graders that a group of high status whites did better than low status whites on all tests of conceptual ability, particularly those involving verbal material. Of course, conceptual ability in the abstract can only be expressed indirectly and through the media of certain forms of symbolism, verbal and non-verbal. Thus, the resultant group differences may not be differences in ability to conceptualize, as much as differences in proficiency with the type of symbolism used. This hypothesis was apparently supported by the fact that no group differences were found when verbal scores were matched and comparisons made on nonverbal material, but, when the reverse was done, there were significant differences on the compared verbal material. In this case, the low status whites were not equally proficient in the use of verbal abstractions compared to the high status group.

Other researchers (Osler, 1970; Scholnick, Osler,

Katzenellenbogen, 1968; and Sigel and Olmsted, 1970) have contributed further evidence to support the hypothesis that prior learning is responsible for the class differences in conceptual ability. Scholnick, Osler, and Katzenellenbogen (1968) and Osler (1970) found that experience on simple discrimination tasks facilitated performance in concept learning. They concluded that prior experience in discrimination permits the development of distinctive mediational responses to stimulus dimensions which aid in hypothesis testing during concept attainment. Sigel and Olmsted (1970) found that lower-class, five to six year old black children increased their ability to form classes, employed a greater variety of attributes and functions of objects in creating these classes, and increased their capacity for articulating the rationale for groupings after receiving classification training. These effects were the result of a month training program and there were measurable long term gains one year later.

Bernstein (1967) also attributed the general academic inadequacy of lower-class students to learned deficiencies in language development and concept formation. He claimed that the language of lower-class children is used to increase consensus concerns rather than signal and symbolize individual separateness and difference. He stated that this restricted code lacks the regulatory mechanisms that are essential to the development of abstract conceptual thinking or advance planning of a logical nature. Although public or

restricted language may serve very well for communication with others who share similar backgrounds, it acts as an ever increasing hindrance to school learning as the school tasks require increasingly elaborate language for the solution of relational or hypothetical problems.

The pupil who is incapable of using an elaborated, personally differentiated code, lacks the ability to use language for logical operations and as a means of interrelating learning. He, therefore, tends to learn by rote and quickly forget. His verbal planning function is short and consequently, his speech is redundant and poorly organized. Furthermore, when confronted with complex conceptual tasks which involve 'coding difficulties' and a need for selection among alternatives, he has no verbal means for reducing the tension engendered by the delay and is more apt to seek physical tension-reduction channels. (Bernstein, 1967, p. 225).

In summary, both the environmentalists and geneticists argue that it is the disadvantaged child's poor verbal and conceptual skills which prevent him from achieving academic success. But while the geneticist would either offer us despair or complacent arrogance, the environmentalist observes the differences between the disadvantaged child whose potential declines and the one whose does not. Having observed and analyzed this difference, the environmentalist then offers an explanation with possible remedial alternatives. At any rate, the genetic argument appears sterile if environmental differences can account for why one deprived child's academic potential declines while another's does not. It is obvious that the lack of the ability to conceptualize, if genetically based, does not influence everyone's academic

potential. equally.

Motivational Explanations:

Schools--Scenes of Cultural Conflict

Many observers have blamed the schools for the disadvantaged child's failure to learn (Holt, 1964; Holt, 1969; Kohl, 1967; Kozol, 1972; Leonard, 1968; Mirthes, 1971; Neill, 1960; Postman and Weingartner, 1969; Von Hilsheimer, 1970). Some claim that the teachers belong to a culture that economically and culturally discriminates against the disadvantaged child.

What u will be reading is blackpoetry. Blackpoetry is written for/to/about & around the lives/spiritactions/humanism & total existence of blackpeople. Black poetry in form/sound/word/usage/intonation/rythm/repetition/direction/definition & beauty is opposed to that which is now (& yesterday) considered poetry, i.e. whi-te poetry. Blackpoetry in its purest form is diametrically opposed to whi-te poetry. Whereas, blackpoets deal in the concrete rather than the abstract (concrete; art for people's sake; black language or Afro-american language in contrast to standard english, & c.). Blackpoetry moves to define & legitimize blackpeople's reality (that which is real to us). Those in power (the unpeople) control and legitimize the negroes' (the realpeople's) reality out of that which they, the unpeople, consider real. (Lee, 1969, p. 15).

If pupils with cultural and language backgrounds different from those of their teachers, have such feelings and attitudes, then, they are likely to interpret their education more as an attempt to put them down or convert them, than to help them.

'I guess that isn't the right word', she said. She was used to apologizing for her use of language. She had been encouraged to do a lot of that in school. Most white people in Midland City were insecure when they spoke, so they kept their sentences short and their words simple, in order to keep embarrassing mistakes to a minimum. Dwayne certainly did that. Patty certainly did that.

This was because their English teachers would wince and cover their ears and give them flunking grades and so on whenever they failed to speak like English aristocrats before the First World War. Also; they were told that they were unworthy to speak or write their language if they couldn't love or understand incomprehensible novels and poems and plays about people long ago and far away, such as Ivanhoe. The black people would not put up with this. They went on talking English every which way. They refused to read books they couldn't understand - on the grounds they couldn't understand them. They would ask impudent questions as, 'Whuffo I want to read no Tale of Two Cities? Whuffo?' (Vonnegut, 1973 p. 138)

The disadvantaged child is an irritant to the educational system. Although he can use a great many words with a fair amount of precision, they are not the words used in school. Deprived children express themselves more readily when reacting to things they can see and do or when talking about some action they have seen.

The underprivileged child has a cognitive style or way of learning that includes a number of features that have unique creative potential: his skill in nonverbal communication (he is not word bound), his proclivity for persisting along one line (one tract creativity), his induction emphasis on many concrete examples, and his colorful free associative feeling for metaphor in language, perhaps best seen in his use of slang. (Weissman, 1962, p. 115).

However, deprived children do not verbalize well in response

to words and this skill plays a vital role for the child in his understanding of the language of the school and the teacher, in his adapting to school routines, and in his mastery of such a fundamental tool subject as reading. Without this skill there is a progressive alienation of teacher from child and child from teacher (Deutsch, M. 1967; Rosenthal, 1973). This progressive alienation contributes to the cumulative deficit observed in experientially deprived children, i.e., the decline over time in measures of their intellectual abilities.

An excellent example of how cultures can clash has been reported by Houston (1973). After telling a story to a child, she then asked the child to repeat the story to another child. She concluded that white children tend to follow instructions to the word. They reproduce details correctly, avoid deviating from the norms set by the adult in charge and repeat memorized relevant material verbatim. Black (poor) children, who hear the same instructions and understand them clearly, react differently. They take the given instructions as a baseline upon which to demonstrate individual imagination and creativity; in a word, flair. They may reproduce general elements from material to be memorized but they prefer to supply their own set of details. In the testing situation the poor black children generally interacted with the other children far more often than did the other groups, and they behaved the same way whether they were paired with a white child or another black child. They clearly attended to each

other instead of the examiner, telling their stories to their partners rather than to the examiner for her approval. They frequently attempted to help their partners, prompting them nearly twice as often as the other groups did. They often involved the whole body, unlike the more confined gestures of the white children.

Thus, the disadvantaged child may not be learning in school because the school expects him to enter the classroom with a given set of attitudes and skills that may be valued as being undesirable by the child's own culture. To Winschel (1970), it was apparent that being disadvantaged was the product of forces outside the individual and that only change in the advantaged could alter the plight of the disadvantaged. Educators have to accept differences in ability and style. The goal should not be one of equivalent people achieving equality but rather of equal people achieving through equivalent opportunities.

On the other hand, Berlin and Gotkin (1967) claimed that one should not be discouraged by those who hold that the school middle-class culture should not be imposed upon lower-class children. Either the child acquires the skills and knowledge to make his way in a world requiring "middle-class skills," or by design or default he does not. The ways of making a decent living without the acquisition of these skills are rapidly being reduced. However, the attainment of these skills should not mean that the child must become alienated from his family or his culture.

Possible Remedies

Compensatory Education

One way for the disadvantaged child to gain the necessary skills to succeed in school might be for him to attend a preschool program. For instance, Blank and Solomon (1968) developed a specialized language program to facilitate abstract thinking in disadvantaged preschool children through short individual tutoring sessions on a daily basis. The role of individual attention in the experiment was controlled through the use of a comparison group which had daily individual sessions without specialized tutoring. A second comparison group was included which consisted of children who received their usual training in the regular nursery school program. The results showed a marked gain in IQ for the groups who received the specialized tutoring and no significant gains for the control groups. These gains were made in a four month experimental program and were measured with the Stanford-Binet and Leiter Scales. Using a similar group of children, Engelmann (1970) taught high, low, and middle IQ groups language, reading, arithmetic, and concept formation. The mean first year gain of those children who were retained in the program for two years was 15.00 points. The mean gain of those who were not continued for a second year was 25.67 points. The total mean gain for the two year Ss after the second year of instruction was 23.83. The mean gain for the control group was 5.11 points. Not one experimental child scored below 1.6

grade level in reading or below 1.4 grade level in arithmetic. There were no instructional failures. Another program, The Harlem Project in New York City, placed extra services in a high school for a three year period. As a result, the group's IQ rose 10 points, the number of graduates tripled, and the number who went on to take some further type of education also tripled (Eisenberg, 1967).

However, according to Baughman (1971) special compensatory programs have been able to produce only modest IQ gains and these have not persisted very long after the children have graduated from their special programs and entered regular school classes. As part of his Millfield study, a kindergarten was established at one of the two black schools in Millfield and also at one of the two white schools. Children were enrolled for full day sessions, five days a week, for the entire academic year. During three successive school years (1962-1963, 1963-1964, 1964-1965), Stanford-Binet Intelligence tests were administered in the fall and spring to the children entering kindergarten and to the children of kindergarten age in the two school districts without kindergartens. During the three years the 80 black children who attended kindergarten showed a mean gain of 1.1 IQ points while the 74 black children who did not attend had a mean loss of .2 of an IQ point. Statistically, this was not a significant difference, and, in practical terms, Baughman did not regard the difference as meaningful. The 83 white kindergarten children, however, had a mean gain of 7.3 IQ points, which is

significantly higher than the mean gain of 2.0 IQ points achieved by the 23 white nonkindergarten children. In this instance, then, a kindergarten program appears to have stimulated a modest degree of intellectual growth among the white children but not among the black.

These findings were offset somewhat, however, by the results obtained from another test--the Primary Mental Abilities Test (PMA) which was administered to the same children using the same research design just described. Data from this test indicated that the rate of intellectual growth for black kindergarten children matched that for white kindergarten children; also, that both groups showed significant gains over their nonkindergarten controls. In fact, the black kindergarten children gained more in comparison with their control subjects than the white kindergarten children.

Despite these improvements, Baughman (1971) still considered his gains discouraging because of the amount of effort needed to produce such a modest amount of intellectual growth. Furthermore, although the implementation on a nationwide scale and evaluation of Head Start were both premature, the preliminary results of its effectiveness showed only marginal positive results (Miller, 1970; White, 1970). Thus, Jensen (1969, 1970) has concluded that compensatory education produces only small changes in intelligence and academic functioning.

Of course, many of those who failed to produce significant changes in the disadvantaged child's intelligence

and academic skills are inclined to discount the gains made by disadvantaged children in "successful" programs. Some of those have charged that the content or form of these programs has been so closely parallel to the actual item content of the evaluation instrument that there is no wonder that positive results were obtained (Zimiles, 1970). Yates (1953), James (1953), Dempster (1954), Wiseman (1954), and Vernon (1954) have actually reported on the effects of test practice and coaching. In these studies, coaching usually implied an emphasis on understanding instructions contained in the test, understanding of the principle underlying each section of the test, and hints which would help enable the children to see more clearly what was required of them and speed up their attack (Dempster, 1954). Wiseman (1954) compared the effects of practice and coaching and found that practice on actual tests was more beneficial than coaching and that the practice gain was correlated positively to initial IQ level. No such effect was found with the coaching group; if anything, the trend was in the reverse direction, with larger gains being made by children with lower IQ's. Intelligence scores on the Moray House Intelligence Tests increased in the following manner: for practice (four tests) and coaching it approximated nine IQ points, for practice alone it was about three points for the first two tests and another three points for the next two tests before leveling off; for coaching it ranged between 4.3 and 6.4 points; and for controls it varied between two and five points (Vernon, 1954). The net gains for coaching

were thus small, in the neighborhood of 1.5 to 4 points. Similarly, the conclusion from studies on SAT, is that intensive drill on items similar to those on SAT produce average increases of less than 10 points on a 600 point scale (Anastasi, 1968). Wiseman (1954) concluded that it was the practice element in coaching which produces gains in IQ scores. Although the Moray House tests are not strictly analogous to such tests as Lorge-Thorndike and Stanford-Binet neither did Engelmann (1970) and Blank and Solomon (1968) give their Ss test practice or coach them on how to take IQ tests. However, the consistent implication is that at least some of the disadvantaged child's low IQ score is due to poor test taking skills and that improving those skills is valuable.

Another way some have used to discount the gains made by disadvantaged children in "successful" programs has been to charge that these gains are ephemeral (Jensen, 1969, 1970). However, Cambell (1970) has demonstrated, using learning theory, that the gains accomplished by compensatory education would be expected to fade out with time. The only condition not entailing a fade out is a situation in which the compensatory input is maintained throughout the educational years. Cambell's model assumed that learning and forgetting rates are the same for both advantaged and disadvantaged children. The only difference between these two groups in the model was in terms of the environmental input, the frequency of effective word exposure. The model did not take

into account a different forgetting rate for the disadvantaged group which would have been the product of interference. The model dealt with the simpler situation, in which the inputs vary in volume (number of rehearsals and number of words) but not in correctness. Neither did the assumed model take into account the common finding that the items most recently learned are the ones which are most likely to be forgotten. Both of these factors would predict greater fade out effects for the disadvantaged children than have been found (Cambell, 1970).

However, these fade out effects occur while the child is attending classes in the regular educational system. This means that although certain compensatory educational programs may be able to increase test performance, they have not been able to improve the disadvantaged child's ability to learn academic skills in a classroom.

The task of the educator is not to remove the symptom of the condition, i.e. low test scores, but to intervene in a way which interrupts the disadvantaged child's lack of relatedness to school. (Zimiles, 1970, p. 224).

Unfortunately, there are many differences between the classroom and the environment in which the disadvantaged child learns best. The learning situation needs to have a high degree of structure and consistency so that the child knows what is expected of him, how and where he can get attention, and within what limits he can safely rebel. The teacher should provide each child with the greatest possible amount of positive reinforcement, both attention and concrete

rewards (Goldberg, 1967). Tangible rewards such as redeemable tokens are useful; but, rewards such as candy can be distracting and should be avoided when teaching (Spence and Segner, 1967).

The disadvantaged child also demands respect as a person and responds well to those who appreciate his efforts and attempt to understand his problems. It was a mistake for Goldberg (1967) to encourage teachers to inhibit their shock at the child's inability to perform adequately or comprehend the most rudimentary concepts. Instead of expressing their feelings, they should be creating a pleasant, attractive, and safe learning environment. Within such an environment the disadvantaged child can be firmly and successfully corrected when he needs it and not when the teacher does. The principles of this approach have been set forth by Harris (1967) and one can find many apt examples in Ginot (1965, 1969).

In summary, previous research has indicated that the disadvantaged child's learning skills are not deficient and yet he is failing to learn the academic skills taught in the classroom. All of the reviewed experts agree that the disadvantaged child's poor verbal and conceptual skills are at least partly responsible for this failure. Some have proposed that it is the quality and amount of verbal stimulation and corrective feedback which a child receives from adults in his preschool years that determines how well he will be able to respond to and use words in school. This argument

assumes that perceptual analysis, language, inference, deduction, and symbolism will appear in sturdy form in any "natural" environment, for each is an inherent competence in the human program (Kagan and Klein, 1973). If the first environment does not permit the full actualization of psychological competencies, the child will function below his ability as long as he remains in that or similar circumstances.

Developing Inherent Competencies

There has also been evidence to indicate that man's inherent competencies develop through a series of consecutive stages, each stage being an indispensable component link in its formative course (Leontiev, 1957). In a "natural" environment, certain of these links form naturally in spontaneous fashion and escape the control of the educator. It is for this reason that when a preceding link is lacking or ill-formed, it creates the illusion of incapacity. When this missing link is retrieved and formed, development continues in a normal fashion.

Thus, it has been hypothesized that an undeveloped inherent competency, the ability to reason verbally and conceptually, is impeding the acquisition of culturally specific talents such as the ability to read, perform mathematical operations, and understand specific words and concepts. Further, that the disadvantaged child's early experiences failed to stimulate the formation of an indispensable component link in the course leading to the actualization

of these language and conceptual skills. Thus, in order for the disadvantaged child to improve his academic skills, it would be necessary to retrieve and form this missing link.

Many educators have contributed ideas on how to develop the ideal curriculum which would intentionally or inadvertently retrieve and form this missing link. One of the basic ideas has been to use tasks with different levels of difficulty. This allows the teacher to match tasks to the appropriate developmental level of the child (Berlin and Gotkin, 1967; Deutsch, C., 1967; and Gordon, 1967). The ideal ordering would be one in which each task of a series would present the child with a challenge whose uncertainty he could reduce by the utilization of previously acquired learning (Bereiter, 1968; Berlin and Gotkin, 1967; and Hunt, 1967). Voyat (1970) claimed that this type of curriculum could directly influence the development of underlying cognitive processes that would eventually enable the child to construct his own rules. This type of curriculum would also elicit correct responses and minimize incorrect responses. In order to help arrive at such an ordering of tasks, C. Deutsch (1967) has recommended that the student be encouraged toward task perseverance and not be permitted to leave tasks unfinished and that the teacher simplify a task that is too difficult until the student can complete it successfully. Another basic idea has been for the teacher to present tasks

repetitively until the generalization is grasped (Bereiter, 1968; Berlin and Gotkin, 1967; Eisenberg, 1967; Reissman, 1962). Ideally, this means that the student is presented with the same problem in a variety of contexts until he is able to solve that problem in any context (Berlin and Gotkin, 1967; Engelmann, 1970; Goldberg, 1967; Hunt, 1967; and Winschel, 1970).

Although these and other educators have contributed ideas on how to develop the ideal curriculum, few have operationalized their ideas and reported positive results. The research of Blank and Solomon (1968) is an outstanding and well challenged demonstration that a specialized language program, developed to facilitate abstract thinking, could improve a disadvantaged child's IQ score. Thus, it is less than certain that language and conceptual skills can be taught. Furthermore, although the ideas of various educators are consistent with Harlow's (1949), Leontiev's (1957) and Galperin's (1957, 1966) conception of how, respectively, "learning sets" are developed and inherent competencies are actualized, there is still the need to show in the Western World that the language and conceptual skills of disadvantaged children can be improved by the use of a conceptual curriculum designed to retrieve and form "missing links". Neither, to the best of the writer's knowledge, has anyone in the Western World compared the affects of conceptual training with tutoring on the academic skills

of disadvantaged children.

Present Study

In the present research, a curriculum based on the above ideas was used to retrieve and form whatever missing link was impeding the development of that inherent competency, the ability to reason verbally and conceptually. This was done by creating a curriculum consisting of various conceptual problems. These conceptual problems were graduated into different levels of difficulty to provide each child with the amount of uncertainty that he could reduce by the utilization of previously acquired learning. At each level of difficulty, the conceptual problem was presented in a variety of contexts to ensure that the concept was grasped and to assist in its generalization. As long as there was no subjectively discernable uncertainty, it was assumed that the child had previously formed the competency to handle that level on the conceptual hierarchy of skills. Similarly, when there was a subjectively discernable amount of uncertainty, it was assumed that the child had not previously formed the competency to handle that level on the conceptual hierarchy of skills. This latter condition was thought to represent a missing link, and the reduction of uncertainty on such a task was thought to represent at least a partial remediation of the deficit. Since the curriculum contained levels covering a wide range of difficulty, it was assumed that each of the disadvantaged children would successfully encounter several

or more tasks producing a subjectively discernable amount of uncertainty. With these missing links better formed, the development of the child's reasoning and conceptual skills ought to continue in a normal fashion.

However, it must be kept in mind that the disadvantaged child is being taught language and conceptual skills in order to help him acquire academic success. Conceptual skills are usually measured by test performance and although certain compensatory educational programs may be able to increase test performance, not even those stressing language development have been able to improve the disadvantaged child's ability to learn academic skills in the classroom. Thus, of primary interest to the present research is whether or not a curriculum designed to retrieve and form "missing links" can improve the disadvantaged child's academic skills and his performance in the classroom.

In order to accomplish this purpose, it would appear best to use older Ss from disadvantaged backgrounds who are actually failing in school. If Leontiev's (1957) conception of how inherent competencies are actualized is correct, then the disadvantaged child will retain the capacity for such an actualization until a later age. To use preschool youngsters, as have most in this area of research, does not allow the experimenter to safely conclude that his Ss have not developed the necessary skills to succeed in school. Furthermore, very little research has been done on

disadvantaged children in the fourth through eighth grades and yet, these grades are important determiners of whether or not a youngster stays in school beyond his sixteenth birthday. If he is not succeeding, he is likely to become discouraged and look elsewhere to establish his adult identity.

In the present research, the disadvantaged children were juvenile delinquents and court wards. These youngsters generally come from socioeconomically deprived and ethnically segregated backgrounds and thus are likely to score lower on these tasks than their non-delinquent peers (Congar and Miller, 1966). Glueck and Glueck (1950) have also demonstrated that even when delinquents are matched with nondelinquents in terms of age, general intelligence, ethnico-racial derivation, and residence in underprivileged urban areas, the delinquent still scores lower on measures of verbal intelligence. This would be especially true for Ss of the present research who were failing in or having particular difficulty with school. Unlike the potential failures of the preschool programs, these Ss had already failed.

In order to assess whether these disadvantaged adolescents had retained the capacity for actualizing their competence for verbal reasoning and concept formation, it was necessary to develop curricula with different content from that used with preschool children. For the Saturday Tutoring Program, the curriculum content was developed and chosen on the basis of what would be relevant to the juvenile

court ward's probable experiences, personal goals, and problems. This type of selection of criterion procedures has the endorsement of Blank and Solomon (1968); Deutsch, C. (1967);

Deutsch, C. and Deutsch, M. (1967); Eisenberg (1967); Epstein (1972); Gordon (1970); Holt (1964, 1969); Hunt (1967); Leonard (1968); Kohl (1967); Kozol (1972); Mirthes (1971); Postman and Weingartner (1969); and Von Hilsheimer (1970).

One of the motivating aspects of the content used in the Saturday Tutoring Program was the fact that most of the lesson plans involved filling out work sheets, playing games, and solving real problems that the youngsters were likely to encounter. For the academic curriculum this meant doing word finds, anagrams, and cross word puzzles; playing scrabble, monopoly, and bingo with words instead of numbers; filling out job applications, learning to use maps and directories, and learning to read on driver's educational manuals and first aid books. Although, with some assistance, a child might be attempting arithmetic and reading above his level because of a particular interest in a game or book, this curriculum consisted mainly of a variety of graduated exercises in math and language on which each child would practice the skills he could already perform.

The conceptual curriculum also utilized work sheets, games and real life problems. Examples of these included secret messages to be decoded, concentration with opposites, and a discussion of freedom versus relativity using graphs. The problems presented by the curriculum were

verbal and included exercises with symbols, sets, and analogies; the study of language, induction, deduction, and graphs; and the analysis of complex problems as well as natural and numerical laws. Because of the age of the Ss and their uneven intellectual development, the ordering of these conceptual skills was not based on any developmental theory. Thus, the above sequence of conceptual problems was not meant to be followed in a rigid fashion. The Ss themselves, by necessity, had a great deal of freedom in selecting what they wanted to learn. However, the different conceptual skills were represented by various problems at different levels of difficulty. In this way each S would encounter the conceptual problems which would first present him with the subjectively discernable amount of uncertainty that he could reduce through the use of previous learning; and second, give him the opportunity to demonstrate and practice his grasp of this conceptual skill on similar problems of different content.

The Saturday Tutoring Program was initiated by the experimenter in the fall of 1971 without knowledge of previous research in the area of compensatory education. During the next two years the program developed a highly motivating learning environment that was voluntarily attended 80 per cent of the time. It was the experimenter's, tutors' and other observers' opinion that these disadvantaged youngsters were improving their academic skills. Thus,

in the summer of 1973, after a relatively thorough review of the literature, an experimental design was developed to test the following hypotheses:

1. That within the learning environment of the Saturday Tutoring Program, juvenile court wards given an academic curriculum would improve their academic skills more than similar Ss in an unseen control group.
2. That within this same environment, these same Ss would not improve their verbal reasoning and conceptual skills more than those Ss in the unseen control group.
3. That within this same environment, similar Ss given a conceptual curriculum would improve their verbal reasoning and conceptual skills more than the Ss from the two previously mentioned groups.
4. That the Ss receiving the conceptual curriculum would also improve their academic skills more than those Ss from the two previously mentioned groups.
5. That the Ss in the unseen control group will not significantly improve their academic, verbal reasoning and conceptual skills.

CHAPTER II

METHODOLOGY

Subjects

The Ss for this research were 30 Juvenile Court wards who were referred to the Wayne County Clinic for Child Study by the court staff for tutoring because of their poor school performance. Some of the Ss were referred in answer to a memo (Appendix A includes a copy of the memo) notifying court workers and clinic staff that referrals for the tutoring program were being accepted. All youngsters between the ages of 11 and 17 were accepted regardless of sex or race. Nearly half, 14 of these Ss, had been in a prior, similar tutoring program at the Clinic. The parents of those referred were sent a letter (Appendix A includes a copy of the letter) explaining the necessary particulars of the program.

Instruments of Measurement

In order to determine the short term effects of tutoring, Ss were tested during the week prior to the first tutoring session and during the first week following the twelfth and last tutoring session. Although they were scheduled to be tested in groups of about 10, because of missed appointments and rescheduling, they were actually tested in groups ranging anywhere from 3 to 14. The examiners were two Wayne County psychometrists who were not involved in the

program in any other way. One of the examiners was a black female, and the other was a white male. These examiners administered the same tests in the same order to each group of Ss. The order of testing was as follows: the Digit Span subtest of the Wechsler Intelligence Scale for Children; the word meaning, paragraph meaning, and arithmetic concepts tests from the primary II battery of the Stanford Achievement Test; the verbal battery form 1, level A of the Lorge-Thorndike Intelligence Test; and the Raven's Progressive Matrices. The time each S worked at this last test was recorded.

The Digit Span subtest of the WISC was chosen because it is a culture free test of memory and learning ability with a surprisingly high loading of g (Jensen, 1970). Jensen (1963) found that some junior high school children classified as "educationally retarded" and having Stanford-Binet IQ's from 50 to 75 could perform a selective learning task as well as a group of gifted children with IQ's above 135 from the same school. The retarded group spanned the entire range of learning ability as measured by this task. Jensen (1963) concluded that this type of learning ability was an important aspect of intelligence. In the present study, the S's raw score on the Digit Span subtest of the WISC was an operational measure of this ability.

The Stanford Achievement Test and Lorge-Thorndike Intelligence Test are respectively the most frequently reported measures of academic skills and verbal reasoning in the literature on compensatory education. The primary II battery

of the Stanford Achievement test and level A of the Lorge-Thorndike Intelligence test were used because previous experience dictated that these Ss would in all probability get only a couple of items correct at the more difficult levels. Abbreviated versions of these tests were used to conserve time.

Thus, operationally, academic performance was defined as the grade level scores each S received on the Stanford Achievement tests of word meaning (vocabulary), paragraph meaning (comprehension) and arithmetic concepts (understanding of numbers and measures). The raw scores on the verbal battery of the Lorge-Thorndike were used to operationally define a S's verbal reasoning skills.

The Raven's Progressive Matrices was chosen because it was so highly recommended by Jensen (1970). He suggested that this test be used to spot those children with potentially strong academic aptitude and to evaluate how successfully different schools were in translating their raw material, the pupil's intelligence, into scholastic achievement. He also liked the fact that the Raven's was highly resistant to improvement through practice or training. He claimed that it was a culture free test of *g* which could predict a child's success at learning under school conditions. He saw tests like the Digit Span subtest of the WISC measuring a lower level of learning ability than the Raven's, which measures the more complex levels involving symbolic or abstract thinking, conceptual learning, semantic generalization and the use of language as a tool of thought in learning and problem solving.

In the present study, a child's conceptual skills were operationally defined as his raw score on the Raven's Progressive Matrices. Raw scores were used as operational measures on the verbal battery of the Lorge-Thorndike and Raven's because of the amount of extrapolation needed to convert these scores into IQ or age equivalency scores.

The amount of time each S worked on the Raven's was operationally defined as the S's motivation and/or task perserverance.

In order to determine the long term effects of the tutoring, the number of days of Youth Home incarceration, the number of days of schools absences, citizenship ratings and grades were collected, where it was possible, for each S.

Data concerning the amount of time spent by each S in the Youth Home was obtained for the 213 days preceding the program (February 28, 1973 through September 29, 1973) and the 213 days following the program (December 15, 1973 through July 16, 1974). This was done by consulting Youth Home records for each S. Only those Ss who were in community placements during the above periods were included in the final statistics. This was done to eliminate those Ss who had been placed outside the jurisdiction of the Wayne County Juvenile Court and possible Youth Home incarceration.

A Release of Information (Appendix A includes a copy of this form) was obtained for every available S from his parent/guardian or the Wayne County Juvenile Court. The Ss were called to determine the schools they attended during the

1972/1973 and 1973/1974 school years. Each school was then contacted. It was explained to the schools that a follow-up was being conducted to determine the effectiveness of a Wayne County Juvenile Court tutoring program attended by the respective youngsters. It was hoped that photostatic copies of school records would be released; however, most schools did not have copy machines available and, therefore, records were for the most part obtained verbally over the telephone. The information collected on each youngster included the number of days absent, conduct or citizenship ratings, and the academic grades for each marking period of the 1972/1973 and 1973/1974 school years. The full school years were used on account of the delayed school opening in the fall of 1973 and the fact that there was no uniform marking period for different schools.

The conduct or citizenship ratings were defined by the Detroit Board of Education as "evidences of growth in habits of courtesy, co-operation, self direction, and responsibility". Excellence was rated as a 1, average as a 2, and unsatisfactory as a 3. The mean citizenship rating of each S for both years was used for analysis.

Two grade point means were computed for each S. One mean was computed for all graded classes and another was computed for only the graded language and math classes. These grade point means were computed by converting letter grades into numbers such that an A was equal to 4, B equal to 3, C equal to 2, D equal to 1, and F or E equal to 0. The grade point means of each S for both years were used for analysis.

Procedure

After the Ss were initially tested, they were randomly divided up into three groups. Those Ss who had been involved in a previous program similar to the one under investigation were divided up separately from those Ss who were new to the program. This was done so that each of the three groups would have an equal number of old and new Ss. The randomization procedure was expected to evenly distribute the other potentially significant S differences such as sex, age, race, and the initial measures of memory and motivation among the three groups. The dividing up was done by designating each S with a different playing card, shuffling, and then dealing the cards in order into piles marked "Conceptual", "Academic", and "Control". Ss from the Conceptual group were given a curriculum of verbal reasoning and conceptual training. Ss from the Academic group were given a curriculum of reading, mathematics, relevant cultural materials, and social studies. Subjects from the Control group were called and told that they had been eliminated by chance from the tutoring program, that they would be paid to come back for retesting at the end of the current one, and that they would be given first consideration for the next tutoring program when it began (Appendix A includes a copy of what each S was uniformly told).

The Ss in each of the two tutored groups were broken up into four classes containing from two to three Ss each. The Ss were grouped into classes on the basis of similarity in the number of correct responses they had obtained on the Raven's

Progressive Matrices. This test had the advantage of being a nonverbal measure of abstract reasoning, a valid test of g with disadvantaged children, and a multiple choice test with the items having a relatively low probability of being responded to correctly by chance. Each of these classes met in a separate office and was tutored by a volunteer or college student. Four of the tutors had participated in previous programs and four of them were new. Like the Ss, old and new tutors were separately and randomly divided up into either the Conceptual or Academic group. This was done so that the two curricula would have an equal number of experienced and inexperienced tutors. Tutors within each group were randomly assigned to one of the four classes.

Tutoring sessions took place on 12 Saturdays. On each Saturday, there were two hours of tutoring and one hour of recreation. The principles of behavior modification were utilized to motivate pupil punctuality and performance during at least one hour of tutoring each week. During the other hour, tokens were used at the discretion of the tutor, though tutors were encouraged to motivate their pupils more interpersonally during this time. All the Ss who could be reached were verbally encouraged to come back for retesting. They were also paid \$3.00 for retaking the tests.

The tutors were trained by the experimenter and four other experienced tutors for three hours on each of the two Saturdays preceding the start of the program. They were trained in the use of behavior modification and the attitudes expressed

by Ginott (1965, 1969) and Harris (1967). One of the experienced tutors was in charge of providing an arts and crafts activity during the recreational period. Another helped out with administrative chores. Each of the two remaining experienced tutors was in charge of developing and training tutors in one of the two curricula.

There were further training and problem solving sessions held after tutoring each Saturday. The experimenter conducted one meeting which was devoted to the problems and ways of relating to and motivating the Ss. All the tutors attended this meeting. The other meetings were devoted to the further development and implementation of the curricula. The two developers of the curricula conducted these meetings separately for their respective tutors without assistance from the experimenter.

The tutors teaching one curriculum were discouraged from discussing their curriculum with the tutors teaching the other one. In case of tutor absences, the developer of the curriculum that that tutor taught would teach the missing tutor's class for that day. If more than one tutor for a given curriculum were missing, then Ss from the class(es) without a tutor were placed with another tutor teaching the same curriculum.

No one but the experimenter knew that the central purpose of the program was to determine whether or not improving a youngster's conceptual skills would lead to improved

academic achievement. The subscribed goals of the program were to improve academic and conceptual skills of the Ss taught these respective curricula.

The curricula were created as least 10 week or 20 hour programs (Appendix B includes both curricula). However, the tutors were encouraged not to go beyond the activities suggested for the first 8 weeks or 16 hours until each S attempted and completed those tasks successfully. Thus, each tutor was instructed to teach a limited number of activities which were graduated in difficulty. Each S's performance was evaluated on every activity by the tutor. The S was given a "one" if the tutor presented the task but the S would not attempt it. The S was given a "two" if he attempted the task without being successful. The S was given a "three" if he attempted the task and completed it successfully. Before a tutor presented a S with an activity requiring a higher level of skill, the S had to receive "threes" on similar activities requiring a lesser level of skill. This approach served as a method of determining precisely what the youngster could do, of teaching him skills he had the capability of learning and maximizing his successes in the process.

Expected Results

Given these procedures, it was expected that initially, there would not be significant group differences among the three groups on such S factors as sex, age, race, memory and motivation. Like the other differences, neither were the

operational measures of memory (the raw score on the Digit Span subtest of the WISC) nor motivation (the amount of time spent on the Raven's Progressive Matrices) expected to change significantly from the pre to post test situation. The raw score on the Digit Span subtest was not expected to change since the Ss were not being trained to improve their short term memory and such influences as anxiety and concentration, like motivation, should fluctuate randomly for all Ss from the pre to post test situation.

However, it was expected that those Ss given the academic curriculum would improve their academic skills significantly more than the Ss in the unseen Control group. These differences in improvement were to be measured by increased grade level scores on the word meaning, paragraph meaning, and arithmetic concepts subtests of the Stanford Achievement test and by improved grades during the 1973/1974 school year. Less directly, these differences in improvement were to be measured by fewer days of Youth Home incarceration, more days of school attendance, and better citizenship ratings.

It was not expected (H_1) that those Ss given the academic curriculum would significantly improve their verbal reasoning and conceptual skills more than the Ss in the unseen Control group. Thus, the differences (H_2) between the raw scores of the pre and post administration of the verbal battery of the Lorge-Thorndike and Raven's Progressive Matrices were not expected to be significantly different for these two groups.

On the other hand, it was expected (H_3) that those Ss given the conceptual curriculum would significantly improve their verbal reasoning and conceptual skills more than Ss from the other two groups. Thus, the differences between their raw scores on the pre and post administration of the verbal battery of the Lorge-Thorndike and Raven's Progressive Matrices would be significantly greater than the differences in the same scores for the other two groups.

It was further expected (H_4) that those Ss given the conceptual curriculum would improve their academic skills more than those Ss given the academic curriculum. These differences in improvement were to be measured by increased grade level scores on the word meaning, paragraph meaning, and arithmetic concepts subtests of the Stanford Achievement test, and by improved grades during the 1973/1974 school year. Less directly, these differences in improvement were to be measured by fewer days of Youth Home incarceration, more days of school attendance, and better citizenship ratings.

Finally, it was not expected (H_5) that the above mentioned grade level scores, raw scores, or behavior of the Ss in the unseen group would improve respectively from the pre to post test situation or from a comparable time period preceding the experimental program to the one following it.

CHAPTER III

ANALYSIS OF RESULTS

In the following section, the effectiveness of conceptual and academic tutoring will be compared against each other and an unseen control group. The measures of effectiveness will include changes in scores on various tests administered prior to and following tutoring, changes in teacher ratings, and changes in certain behavioral observations. After establishing the random distribution of potentially significant S differences, the significance of the differential group changes were tested for each hypothesis using a single-factor analysis of variance. This type of statistical analysis was used because the primary objective of a single factor experiment is like the goal of this experiment, to compare the relative effectiveness of two or more treatments on a common criterion (Weiner, 1962). Operationally this meant that an analysis of variance was performed on the changes in performance for all three groups and that the resultant MS_{error} was used as the denominator for the relevant between group comparison for each hypothesis.

Randomization

The randomization process successfully distributed such potentially significant differences as race, sex, and the initial measures of memory and motivation among the three groups. The number of males/females and blacks/whites in each of the three initial groups and the resultant chi squares are presented in Table 1. The number of males/females and blacks/whites who returned for retesting in each of the three groups and the resultant chi squares are presented in Table 2. None of the chi squares even approached significance at the .10 level. The mean age, mean raw score on the Digit Span subtest, mean minutes spent working at the Raven's Progressive Matrices for the original groups, and the resultant F_{obs} using an analysis of variance are presented in Table 3. Table 4 contains these same group means and F_{obs} for only those Ss who returned for retesting. None of the above F_{obs} were significant at the .10 level.

Table 1

A Comparison of the Number of Males/Females and Blacks/Whites in the Original Three Groups

Ss	Conceptual N = 10	Groups Academic N = 10	Control N = 10	Chi Square
Sex				
Male	8	6	5	2.01
Female	2	4	5	
Race				
Black	8	9	7	1.24
White	2	1	3	

Table 2

A Comparison of the Number of Males/Females and Blacks/Whites Who Returned for Retesting in each of the Three Groups

Ss	Groups			Chi Square
	Conceptual N = 8	Academic N = 6	Control N = 5	
Sex				
Male	6	4	4	0.26
Female	2	2	1	
Race				
Black	7	5	3	1.50
White	1	1	2	

Table 3

A Comparison of the Mean Age, Mean Raw Score on the Digit Span Subtest of the WISC, and Mean Minutes Spent Working on the Raven's Progressive Matrices for the Original Three Groups

Ss	Group Means			F obs
	Conceptual N = 10	Academic N = 10	Control N = 10	
Age	13.83	14.04	13.91	1.82
Raw Score on Digit Span Subtest of WISC	10.10	8.40	9.40	1.89
Minutes Spent Working at Raven's	10.55	13.45 N = 9*	10.95	1.44

*Examiner forgot to record the time for one S.

Table 4

A Comparison of the Mean Age, Mean Raw Score on the Digit Span Subtest of the WISC, and Mean Minutes Spent Working on the Raven's Progressive Matrices for those Ss Who Were to Return for Retesting in each of the Three Groups

Ss	Group Means N = 19			F _{obs}
	Conceptual N = 8	Academic N = 6	Control N = 5	
Age	13.66	14.92	14.43	.03
Raw Score on the Digit Span Subtest of WISC	9.88	8.83	9.60	1.06
Minutes Spent Work- ing at Raven's	10.56	12.50	10.20	1.51

It was further expected that the operational measures of learning ability (the raw score on the Digit Span subtest of the WISC) and motivation (the amount of time spent on the Raven's Progressive Matrices) would not change significantly from the pre to post test situation. The 19 retested Ss repeated on the average .10 less digits on retesting (from 9.47 to 9.37). They also spent an average of 1.12 minutes less time working at the Raven's (from 11.08 to 9.96 minutes). By inspection, it was concluded that these changes were not significant.

A comparison of the changes in the pre to post treatment measure of learning ability and motivation for each of the

three groups was also made. The mean changes in the raw score on the Digit Span Subtest of the WISC and in the minutes spent working at the Raven's Progressive Matrices for all three groups over the experimental period are presented in Table 5.

Table 5

A Comparison of the Mean Changes in the Raw Score on the Digit Span Subtest of the WISC and in the Minutes Spent Working at the Raven's Among the Three Groups over the Experimental Period

Test	Conceptual N = 8	Group Academic N = 6	Control N = 5	F _{obs}
Digit Span Subtest of the WISC	-1.00	.33	.80	1.79
Raven's	-1.25	-3.66	2.13	1.69

As can be noted from Table 5, there were no significant differences among the mean changes for the operational measures of memory and motivation. However, when an analysis of variance was used to compare the means of two groups or the mean of one group with the mean of the other two groups taken together, there were some minimally significant results. For instance, the conceptual group's poorer performance on the Digit Span Subtest was significantly different from the improved performance of the control group ($F_{obs} = 3.06$) and the academic and control groups taken together ($F_{obs} = 3.47$) at the .10 level. The control group's time gain on the Raven's was also significantly different from the academic

group's time loss ($F_{obs} = 3.37$) at the .10 level. Although both this statistical procedure and the level of significance make these findings of dubious statistical significance, they do suggest differential group changes in, perhaps, the attitude of Ss towards the testing that could be meaningful to their other test scores.

Although there were no statistically significant differences between the groups on the above criteria, the Ss in the conceptual group did attend tutoring significantly more than the academic group. The mean hours of tutoring and the T_{obs} for all the original Ss, for just those not incarcerated in the Youth Home, and for those who returned for retesting is presented for the two groups in Table 6.

Table 6

A Comparison of the Mean Hours of Tutoring and the T_{obs} for the Original Group, the Original Group Minus Those Ss in the Youth Home, and Those Ss Who Returned for Retesting

Ss	Group		Group		T_{obs}
	Conceptual N	Mean	Academic N	Mean	
Original	10	19.10	10	13.60	3.38***
Original Minus Ss in the Youth Home	8	20.00	9	14.78	2.02*
Retested	8	19.75	6	16.67	1.22

*p < .10					
***p < .01					

As seen from Table 6, Ss in the conceptual group were more likely to attend tutoring than those in the academic group ($p < .01$).^{*} Even after excluding those Ss in the Youth Home, who had to merely get up early, and comparing the groups on only those Ss who had to find their own way to tutoring, there was still the suggestion that Ss in the conceptual group attended more often ($p < .10$). Although this might indicate an initial difference in S's desire for tutoring, because there were no significant differences between the groups on the other initial measures, it is more reasonable to conclude that the conceptual curriculum was more motivating. It can also be noted in Table 6 that the difference between the mean hours of tutoring for the retested Ss of each group was not significant.

Comparison of Group Changes

The first major hypothesis to be tested was that Ss given the academic curriculum (control I) would improve their academic skills, as operationally defined, more than Ss in the unseen control group (control II). In the following sections, initial scores and data will only refer to the initial scores and data of those Ss who either returned for testing or where comparable data was collectable following the experimental period.

The first operational definition of S's academic skills was his performance on the Stanford Achievement tests measuring word meaning, paragraph meaning, and arithmetic concepts. The mean initial and follow-up grade level scores

on these tests for the 6 Ss in the academic group and 5 Ss in the control group are presented in Tables 14 and 15 respectively. The mean changes in grade level for the two groups were compared using an analysis of variance. These mean changes in grade level and the resultant F_{obs} from their comparison are presented in Table 7. As an overall measure of academic skill, the change in grade level for all three tests taken together was also compared for the two groups. The means are presented in Tables 14 and 15 and the mean change and F_{obs} in Table 7.

Table 7

A Comparison of the Mean Grade Level Changes on the Stanford Achievement Tests of the Academic and Control Groups over the Experimental Period

Test	Group		Difference	F_{obs}
	Academic N = 6	Control N = 5		
Word Meaning	.47	.20	.27	1.04
Paragraph Meaning	.15	-.14	.29	.38
Arithmetic Concepts	-.80	.16	-.96	3.51*
Combined	-.06	.07	-.13	.38

* $F_{.90}(1,16) = 3.05$				

As can be seen from Table 7, the academic group did not improve their academic skills on the Stanford Achievement tests more than the unseen control group. In fact,

the academic group did so much worse on the test measuring arithmetic concepts that combined with a slight improvement by the control group, there was a slight statistical difference in favor of the control group.

Another measure of S's academic skills was his functioning in school. This functioning was judged by teachers and recorded as grades and citizenship ratings. None of the teachers were informed by the experimenter or his associates that one of their pupils was S in a research or special tutoring program. The initial contact for collecting school data was not made until after the school year. Both a total mean grade point and a mean grade point derived from only those classes specifically involving language and arithmetic skills were determined for each S. The latter classes consisted of English, handwriting, literature, reading, communication skills, foreign language, oral expression, spelling and arithmetic. A grade was typically recorded twice a year per class for each S. If only the final average in a class could be collected, S was considered to have received that final average for both semesters. If S received grades on the quarter system, a grade represented the average of two quarters and of three consecutive quarters in a class if that class was not taken for the fourth quarter. Letter grades were converted into the four point numerical system where a failing grade was equal to 0 and an "A" was equal to 4. If the grade had a "+" or "-" after it, .33 was added to or subtracted from, respectively, the number into

which that grade had been converted.

The mean grade points for all graded classes and only those classes involving language and math from both the 1972-73 and the 1973-74 school years for the academic and control groups can be found, respectively, in Tables 14 and 15. The comparisons of the mean changes using analyses of variance are presented in Table 8. As can be seen from the table, the academic group did not improve their language and math skills significantly more than the control group. However, the academic group did better than the control group when all the grades were considered ($p < .10$).

Table 8

A Comparison of the Mean Changes in Grade Point for All Graded Classes and only Those Classes Involving Language and Math for the Academic and Control Groups

Classes	Group		Difference	F _{obs}
	Aca. N=5	Con. N=6		
Language and Math	.57	-.17	.74	2.69
All Classes	.51	-.10	.61	3.24*

* $F_{.90}(1,15) = 3.07$

The citizenship rating was the other teacher evaluation that was used as a less direct measure of his academic performance. School citizenship ratings were

defined as, "Evidences of growth in habits of courtesy, co-operation, self direction, and responsibility." (From Form 29 - Attendance and Scholarship Record). Excellence was rated as a 1, average as a 2, and unsatisfactory as a 3. The number of citizenship ratings depended on how many different teachers S had. For the purposes of this research, if S had more than one rating, his ratings were averaged so that there was only one entry per year for each S. The mean rating was 2.22 for the 17 Ss whose data were collectable during the 1972-73 school year. For the 1973-74 school year, it was 2.15 for 18 Ss. Data were collectable for both school years on only 15 Ss, 5 Ss from each of the 3 groups. The mean citizenship ratings for the academic and control groups were 2.20 and 2.37 respectively, for both school years. Thus, the Ss given the academic curriculum did not improve their school behavior, as measured by their citizenship ratings, more than the Ss in the unseen control group.

In addition to teacher ratings, the number of school days S missed was compared for the 1972-73 and 1973-74 school years. No differentiation between excused and unexcused absences was made because the school and court records did not make such a distinction. The mean number of days of school absence for the academic and control groups for the 1972-73 and 1973-74 school years are presented in Tables 14 and 15. Each of these groups had one S who attended school during the 1972-73 school year and was placed in a residential setting in 1973 and one S who failed to attend school either year.

Each group also had one S who attended classes that did not keep attendance during the 1972-73 school year. The S in the academic group continued to attend such classes during the 1973-74 school year and the S in the control group did not. An analysis of variance was used to test the hypothesis that the average changes in absenteeism were equal for the two groups. The F_{obs} was 1.48. Thus, the academic group's absenteeism did not increase significantly less than did the absenteeism of the control group. The critical value for a .10 level test is $F_{.90}(1,18) = 3.01$.

Another behavioral observation that was used as an operational definition of S's adjustment was the number of days each S spent incarcerated in the Youth Home for the seven months prior to and following the experimental or treatment period. Because they represented special placement problems, the three Ss who were in the Youth Home at the time of the initial testing were eliminated from the S population on this particular measure of adjustment. Of the conceptual, academic, and control Ss, only 5, 2, and 3 Ss respectively were incarcerated during those time periods. The two Ss in the academic group spent a total of 13 days in the Youth Home prior to the program and none afterwards. The three Ss in the control group spent a total of 31.5 days prior to the program and 28.5 days afterwards. Although the very small number of Ss restricts the significance of any statistical decision, an analysis of variance was used to test the hypothesis that

these changes in days of incarceration were equal for the two groups. The F_{obs} was .77. The critical value for a .10-level test is $F_{.00}(1,7) = 3.59$. Hence, the academic group's time of incarceration did not decline significantly more than did that of the control group.

The second major hypothesis to be tested was that Ss given the academic curriculum would not improve their verbal reasoning and conceptual skills, as operationally defined, more than Ss in the unseen control group. S's raw score on the verbal battery of the Lorge-Thorndike Intelligence Test was the operational definition of his verbal reasoning ability. The raw scores were used because the table used to convert raw scores into I.Q.s for Level A, form 1 of the verbal battery had an age range of 8 years to 13 years, 6 months. The mean age of the 30 Ss at the initial testing was 13 years, 11 months. Thus, Level A was not the appropriate test for the age range of the Ss. However, even on this level, the grade level scores of five Ss would have had to be obtained through extrapolation because they were so low. By assigning to those Ss older than 13 years, 6 months, a scale score equal to that of one who was 13 years, 6 months, an approximate I.Q. was reached. Using the I.Q.s obtained in this manner, the mean I.Q. of the initial group of 30 Ss was 64.03. This mean is more than two standard deviations lower than the population mean for the test and suggests that in the present experiment, the average S's intellectual functioning was initially in the second percentile. The reliability of scores this far from

a population mean would make any statistical analysis highly suspect.

S's raw score on the Raven's Progressive Matrices was also used as the operational definition of his conceptual skills. Raw scores were again used because of the amount of interpolation and extrapolation needed to convert the generally low scores into percentiles. The initial and follow-up mean number of correct responses on the verbal battery of the Lorge-Thorndike and Raven's Progressive Matrices for the academic and control groups are presented in Tables 14 and 15 respectively. A comparison of the mean changes in the number of correct responses on these two tests for the above two groups is presented in Table 9. As can be seen from Table 9, the academic group did not improve their verbal reasoning or conceptual ability, as operationally defined, significantly more than the control group.

Table 9

A Comparison of the Mean Changes in the Number of Correct Responses on the Lorge-Thorndike and Raven's Progressive Matrices for the Academic and Control Groups

Test	Group		Difference	Fobs
	Aca. N=6	Con. N=5		
Verbal battery of Lorge-Thorndike	12.67	7.80	4.87	.60
Raven's Progressive Matrices	1.00	1.20	-.20	

Table 10

A Comparison of the Mean Changes in the Number of Correct Responses on the Lorge-Thorndike and Raven's Progressive Matrices Between the Conceptual Group and Both the Academic and Control Groups Alone and Together

Groups	Lorge-Thorndike		Raven's	
	Difference	F _{obs}	Difference	F _{obs}
Conceptual (N=8) versus				
Academic (N = 6)	-4.54	.66	-1.74	.49
Control (N = 5)	.32	.00	-1.94	.55
Academic and Control	-2.33	.19	-1.84	.75

The third major hypothesis to be tested was that Ss given the conceptual curriculum would improve their verbal reasoning and conceptual skills, as operationally defined, more than the Ss from the other two groups. S's raw score on Level A, from 1 of the verbal battery of the Lorge-Thorndike Intelligence Test and the Raven's Progressive Matrices were the operational definitions of his verbal reasoning ability for reasons previously given. The initial and follow-up mean number of correct responses on the verbal battery of the Lorge-Thorndike and Raven's Progressive Matrices for the conceptual, academic, and control groups are presented in Tables 13, 14, and 15 respectively. A comparison of the mean changes in the number of correct responses on these two tests between the conceptual group and the other two groups is presented in Table 10. As is obvious from this table, the conceptual group did not improve their verbal reasoning or conceptual ability more than the academic group and/or the untutored control group.

The fourth major hypothesis to be tested was that Ss given the conceptual curriculum would improve their academic skills, as operationally defined, more than the Ss from the other two groups. The first operational definition of S's academic skills was his performance on the Stanford Achievement tests measuring word meaning, paragraph meaning, and arithmetic concepts. The pre and post mean grade levels on the Stanford Achievement Tests for the conceptual,

Table 11

A Comparison of the Mean Grade Level Changes on the Stanford Achievement Tests Between the Conceptual Group and Both the Academic and Control Groups Alone and Together

Groups	Tests					
	Word Meaning		Paragraph Meaning		Arith. Concepts	
Conceptual (N=8) Versus	Diff.	F obs	Diff.	F obs	Diff.	F obs
Academic (N=6)	- .15	.41	.36	.74	1.16	6.54**
Control (N=5)	.12	.23	.65	2.17	.20	.33
Academic and Control	-.02	.00	.51	1.96	.42	1.62
						5.68**
** $F_{.95}(1,16) = 4.49$						

academic and control groups are presented in Tables 13, 14, and 15 respectively. The pre to post test changes between the conceptual group and the other two groups were compared using an analysis of variance. The differences in mean changes in grade level and the resultant F obs from their comparison are presented in Table 11. As an overall measure of academic skill, the mean change in grade level for all three tests taken together was also used for comparison.

Among the achievement tests, only on the one measuring arithmetic concepts did the conceptual group improve significantly more than the academic group. However, the conceptual group also improved their overall academic performance significantly more than the academic group ($p < .05$). Although this would suggest that a conceptual curriculum improves the academic skills of disadvantaged children more than an academic curriculum, this superiority could be due to the fact that the conceptual curriculum was more motivating. In order to remove the effects of such motivation on attendance, each S's change in combined grade level was adjusted for the number of hours he was present in the clinic. This was done by using an analysis of covariance. The result of equating the two groups for time spent in tutoring was an adjusted F ratio, 3.67 ($p < .10$). Thus, it is inconclusive whether or not the content of the conceptual curriculum, aside from being more motivating, improved academic skills significantly more than the academic curriculum. It can also be seen from Table 11, that although the conceptual group improved their academic

skills significantly more than the academic and control groups taken together, the conceptual group did not improve these skills more than the control group by itself.

The grades Ss received in school were also used as an operational definition of their academic skills. How these grades were recorded has been previously described. The mean grade points for all graded classes and only those classes involving language and math from both the 1972-73 and 1973-74 school years for the conceptual, academic, and control groups are presented in Tables 13, 14, and 15 respectively. By inspecting the comparison of these mean changes in Table 12, it is clear that there were no significant differences between the changes in grade point for classes in language and math between the conceptual group and both the academic and control groups taken alone and together. However, a further analysis was done to test the hypothesis that the changes in grade point for the language and math classes were equal for both of the treatment groups (conceptual and academic) and the unseen control group. The F_{obs} of 3.23 exceeded the critical value for a .10 level where $F_{.90}(1,15) = 3.07$. Thus, Ss tutored, regardless of whether they were tutored with a conceptual or academic curriculum, improved their grades in language and math significantly more than the unseen control group.

It is also obvious from Table 12 that there were no significant differences between the changes in total grade point for the conceptual and the other two groups. In fact, in the case of the conceptual and academic groups, the data

Table 12

A Comparison of the Mean Changes in Grade Point for All Graded Classes and Only Those Classes Involving Language and Math Between the Conceptual Group and Both the Academic and Control Groups Alone and Together

Groups	Classes		
	All Graded Classes Difference	Language and Math Classes Difference	Fobs
Conceptual (N=7) Versus			
Academic (N = 5)	-.52	-.14	.14
Control (N = 6)	.08	.60	2.11
Academic and Control	-.20	.26	.41

were in reverse of the expected direction. Clearly, the Ss from the conceptual group did not improve their academic skills, as measured by their school grades, significantly more than the Ss from the academic group.

As previously mentioned, S's citizenship rating was also used as a less direct measure of his academic performance. With a 1 equalling excellence; 2, satisfactory; 3, unsatisfactory; the mean citizenship ratings for the conceptual group were respectively, 2.03 and 1.95 for the 1972-73, 1973-74 school years. The mean citizenship ratings were 2.30 and 2.37 for both years in the cases of the academic and control groups respectively. Thus, the Ss given the conceptual curriculum did not improve their school behavior, as measured by their citizenship ratings, more than the Ss in the academic and unseen control groups.

The school attendance of the conceptual group was also compared to that of the other two groups. The mean number of days of school absence for the conceptual, academic, and control groups for the 1972-73 and 1973-74 school years is presented in Tables 13, 14, and 15 respectively. Each of these groups had one S who attended school during the 1972-73 school year and was placed in a residential setting in 1973 and one S who failed to attend a school either year. Instead of having a third S attending classes in 1972-73 that did not keep attendance, as in the cases of the academic and control groups, the conceptual group's had been hospitalized. This same S missed only 3 days of school during the 1973-74 school

year. The S from the academic group continued to attend classes that did not keep attendance while the S from the control group stopped attending classes all together in 1973-74. An analysis of variance was used to test the hypothesis that the mean changes in absenteeism were equal for the conceptual and academic groups. The F_{obs} was 0.20. The critical value for a .10 level test is $F_{.90}(1,18) = 3.01$. Thus, the conceptual group's absenteeism did not increase significantly less than did the absenteeism of the academic group.

A further analysis was used to test the hypothesis that the mean changes in absenteeism during these same time periods were equal for the conceptual and unseen control groups. The seven Ss in the control group had missed a total of 283 more days in the 1973-74 school year than they had during the preceding year. Although this worked out to 40.43 days per S compared to .28 days per S for the conceptual group, the F_{obs} was equal to 2.77 and was not significant at the .10 level where $F_{.90}(1,18) = 3.01$. (See Tables 13, 14, and 15) This means that the changes in absenteeism were not significantly different for the conceptual and control groups.

As described earlier, another behavioral observation that was used as an operational definition of a S's adjustment was the number of days each S spent incarcerated in the Youth Home for the seven months prior to and following the experimental period. The five Ss in the conceptual group spent a total of 70 days in the Youth Home prior to the program

and only half-a-day afterwards. The two Ss in the academic group spent a total of 13 days prior to the program and none afterwards. Although the very small number of Ss restricts the significance of any statistical decision, an analysis of variance was used to test the hypothesis that these changes in days of incarceration were equal for the two groups. The F_{obs} was 1.64 and did not exceed the critical value of 3.59 for $F_{.90}(1,17)$. Thus, the conceptual group's time of incarceration did not decline significantly more than did that of the academic group.

However, when the F statistic was used to test the hypothesis that these changes in Youth Home Incarceration were equal for the three groups, an F_{obs} of 3.39 was obtained. This F_{obs} exceeded the critical value of 3.26 for $F_{.90}(2,7)$. Furthermore, when the changes in time for the conceptual group was compared with that of the academic and control groups taken together, the F_{obs} was 5.32 and also exceeded the critical value of 3.59 for $F_{.90}(1,7)$. The comparison of the conceptual and control groups on this same dimension produced an F_{obs} of 6.60 which exceeded the critical value of 5.59 for $F_{.95}(1,7)$. Thus, it would appear that the conceptual group's time of incarceration declined significantly more than did that of the control group. However, one must remember the very small number of Ss available for analysis.

The fifth major hypothesis was that the Ss in the unseen control group would not improve their academic, verbal

reasoning, and conceptual skills, as operationally defined during the experiment. The mean performances of the Ss in the unseen control, both prior to and following the experimental period, on all the operational measures of academic and conceptual skills are presented in Table 15.

By inspection, it can be concluded that the control group did not significantly improve their academic or conceptual skills as measured by the Stanford Achievement Tests, school grades, citizenship ratings, Raven's Progressive Matrices, and the verbal battery of the Lorge-Thorndike. However, by considering the study to be a two factor experiment with repeated measures, the effects of not being tutored on absenteeism was analyzed and it was determined that the seven Ss in the unseen control group did miss significantly more days of school in 1973-74 than they had in 1972-73 ($p < .05$). The fact that the above mean changes in test performance were all small and in the positive direction in five out of six cases would suggest that these measures were reliable for the Ss in this experiment and that there was some slight practice effect.

Evaluative Summary of the Results

In evaluating the results, one is struck by the lack of significance at the .05 level. Regarding hypothesis one, that the Ss tutored in the academic curriculum would improve their academic skills more than the untutored Ss, not one of the eight independent operational measures of

Table 13

The Mean Performances of the Ss in the Conceptual Group
Both Prior to and Following the Experimental Period, on all
the Operational Measures of Academic and Conceptual Skill

Operational Measures	Pre	Post	Change
Academic			
Grade Level Scores on the Stanford Achievement Tests			
N = 8			
Word Meaning	3.48	3.80	.32
Paragraph Meaning	2.61	3.12	.51
Arithmetic Concepts	3.39	3.75	.36
Mean Academic	3.16	3.56	.40
	1972-73	1973-74	
Grade Point in Language and Math ¹			
N = 7	.95	1.38	.43
Total Grade Point ¹			
N = 7	1.49	1.48	-.02
Citizenship Rating ²			
N = 5	2.03	1.95	-.08
Number of Days Absent			
N = 7	31.28	31.57	.28
Number of Days of Youth ³ Home Incarceration			
N = 5	14.00	.10	-13.90
Conceptual			
Raw Scores on the Raven's Progressive Matrices			
N = 8	23.62	22.88	-.75
Raw Scores on Level A, form 1 of the Lorge-Thorndike Intelligence Test			
N = 8	36.12	44.25	8.12

¹ 4 point grading scale where failing equals 0 and an "A" equals 4. ² 3 point rating scale where a 1 equals excellence and 3 equals unsatisfactory. ³ For the period 7 months prior to and 7 months following the program			

Table 14

The Mean Performance of the Ss in the Academic Group
Both Prior to and Following the Experimental Period, on all
the Operational Measures of Academic and Conceptual Skill

Operational Measures	Pre	Post	Change
Academic			
Grade Level Scores on the Stanford Achievement Tests N = 6			
Word Meaning	3.23	3.70	.47
Paragraph Meaning	2.88	3.03	.15
Arithmetic Concepts	4.22	3.42	-.80
Mean Academic	3.44	3.38	-.06
	1972-73	1973-74	
Grade Point in Language and Math ¹ N = 5	1.38	1.95	.57
Total Grade Point ¹ N = 5	1.49	2.00	.51
Citizenship Rating ² N = 5	2.20	2.20	.00
Number of Days Absent N = 7	30.00	41.07	11.07
Number of Days of Youth ³ Home Incarceration N = 2	13.00	.00	-13.00
Conceptual			
Raw Scores on the Raven's Progressive Matrices N = 6	24.33	25.33	1.00
Raw Scores on Level A, form 1 of the Lorge-Thorndike Intelligence Test N = 6	27.17	39.83	12.67

¹ 4 point grading scale where failing equals 0 and an "A" equals 4			
² 3 point rating scale where a 1 equals excellence and 3 equals unsatisfactory			
³ For the period 7 months prior to and 7 months following the program			

Table 15

The Mean Performances of the Ss in the Unseen Control Group Both Prior to and Following the Experimental Period, on all the Operational Measures of Academic and Conceptual Skill

Operational Measures	Pre	Post	Change	F _{obs}
Academic				
Grade Level Scores on the Stanford Achievement Tests N = 5				
Word Meaning	4.16	4.36	.20	
Paragraph Meaning	3.98	3.84	-.14	
Arithmetic Concepts	4.28	4.44	.16	
Mean Academic	4.14	4.21	.07	
	1972-73	1973-74		
Grade Point in Language and Math ¹ N = 6	.87	.70	-.17	
Total Grade Point ¹ N = 6	1.06	.96	-.10	
Citizenship Rating ² N = 5	2.37	2.37	.00	
Number of Days Absent N = 7	32.78	73.21	40.43	5.52**
Number of Days of Youth ³ Home Incarceration N = 3	31.50	28.50	-3.0	
Conceptual				
Raw Scores on the Raven's Progressive Matrices N = 5	28.00	29.20	1.20	
Raw Scores on Level A, form 1 of the Lorge-Thorndike Intelligence Test N = 5	46.80	54.60	7.80	

** $F_{.95}(1,18) = 4.41$

¹ 4 point grading scale where failing equals 0 and an "A" equals 4

² 3 point rating scale where a 1 equals excellence and 3 equals unsatisfactory

³ For the period 7 months prior to and 7 months following the program

academic skill confirmed this hypothesis. Hypothesis two, that the Ss tutored in the academic curriculum would not improve their verbal reasoning and conceptual skills more than the untutored Ss was confirmed. However, neither did the Ss tutored in the conceptual curriculum improve their verbal reasoning and conceptual skills more than the Ss tutored in the academic curriculum or the Ss in the untutored control group. Thus, hypothesis three was rejected. Regarding hypothesis four, there was significant evidence that those Ss tutored in the conceptual curriculum improved their academic skills more than those Ss tutored in the academic curriculum, and those Ss in the untutored control group. Hypothesis five, that the untutored Ss would not significantly improve their academic, verbal reasoning, and conceptual skills was confirmed by all the operational measures.

Since only three comparisons were made following an overall F, the overall probability of wrongly accepting the null hypotheses was .14. There were also a high number of results in the expected direction which were significant at the .10 level. This would suggest that more hours of tutoring and/or the full participation of more Ss could have given more definite results regarding hypothesis four.

CHAPTER IV

DISCUSSION

The central purpose of this study was to compare the effects of conceptual training and tutoring on the academic skills of disadvantaged children.

For a multitude of reasons, there has been wide spread belief that the poor academic performance of disadvantaged youngsters is due to their inadequately formed verbal reasoning and conceptual skills (Anglin, 1970; Bernstein, 1967; Eisenberg, 1967; Jensen, 1970). Some have claimed that heredity is responsible (Bereiter, 1970 and Jensen, 1970). Others have claimed that conceptual skills are learned just like any other skill (Bernstein, 1967; Engelmann, 1970; Harlow, 1949; John, 1963; John and Goldstein, 1967; Milner, 1951; Osler, 1970; Scholnick, Osler, Katzenellenbogen, 1968; Sigel and Olmsted, 1970; Siller, 1957). If the environment does not provide the opportunity for learning a skill, then the skill is not learned. Some of those supporting this inadequate learning opportunities explanation have hypothesized that these youngsters failed to learn one or more component skills of the complex mental processes involving symbolic or abstract thinking, conceptual learning, semantic generalization, and the use of language as a tool of thought in learning and problem solving (Harlow, 1949).

Galperin, 1957, 1966, Leontiev, 1957). This deficiency handicapped their subsequent mental development. The goal of this study was to provide the child with the opportunity to learn the "missing" verbal reasoning and conceptual skills that will enable him to catch up with his more fortunate peers in the academic field.

These verbal reasoning and conceptual skills have been commonly measured by paper and pencil tests. Two of these tests were used to measure the above skills in the present experiment. The results confirmed hypothesis two, which predicted that the Ss tutored in academic subjects would not improve their verbal reasoning and conceptual skills more than the untutored Ss (Table 9). However, the results did not support hypothesis three, that Ss given conceptual training would improve their verbal reasoning and conceptual skills more than those Ss in the other two groups (Table 10). The untutored Ss did not significantly improve their verbal reasoning and conceptual skills as predicted by hypothesis five.

These negative results may, at least in part, be a function of the testing. As previously discussed in this paper (pages 2-7), it is difficult to effectively test the disadvantaged child because he is not prepared or motivated to take tests (Ausubel, 1967; Fishman, et al., 1967; Kennedy, Van de Riet and White, 1963; Reissman, 1962; Rosenthal and Jacobson, 1968). For instance, even though they were being paid \$3.00 to retake the tests, only 78 per cent of the

tutored and 56 per cent of the untutored Ss who could have returned, actually did so. In addition, these Ss apparently rushed through the tests, taking only a little more than one-third the time it is expected to take an adult to finish the Raven's Progressive Matrices. The investigation of the results of the randomization procedure would suggest that these problems in test taking should equally affect the Ss in each of the three groups (Tables 1, 2, 3, and 4). The trouble is that paper and pencil tests may be insensitive measures of the disadvantaged child's academic and conceptual skills and as such, they will not detect any changes in these skills. Furthermore, on retesting there was the suggestion that the untutored Ss had done better while the tutored Ss had done worse on tests of memory, concentration and motivation (Table 5). Combined with the already described test bias, they represent further problems for the detection of any significant changes in the skills of tutored Ss.

One explanation for these differential changes in concentration and motivation would be that the tutored Ss would feel more comfortable than the untutored Ss about coming to the building, but would still feel uncomfortable about taking the tests. For the untutored Ss, the whole situation would be uncomfortable and more of them would simply not come back. This assumes that the Ss in the present study lack the motivation and confidence to succeed and that they reduce their situational anxiety through avoidance or withdrawal mechanisms. In addition, those untutored Ss

who did come back would be more motivated to do better on retesting. They would have interpreted their elimination from the experimental program as rejection despite being reassured to the contrary. Since they had returned, it is very likely that, in addition to being paid \$3.00, they wanted to do better in order to get into the next tutoring session. It is also likely that the relaxed joyous mood and child centered techniques used to motivate attendance and performance during tutoring would be in sharp contrast to the rigorous testing situation and that this might have interfered with test taking. The above assumptions and reasoning were supported not only by the trends in test performance and attendance, but also by the complaints of the Ss and the behavioral observations made by the examiners. Several of the tutored Ss came in "high" and several others expressed unhappiness at having to retake "the _____ tests". In addition, although the examiners complained to the researcher about several of the tutored Ss, they did not complain about the behavior of any of the untutored Ss.

Although the above discussion is one way to explain why the Ss given the conceptual training did not improve their verbal reasoning and conceptual skills on the tests purporting to measure such skills, Jensen (1970) has offered a different one. He proposed that the development of complex mental abilities depends on the development of innate neural structures. He based this allegation on the fact that performance on the

best tests of these abilities, such as the Raven's Progressive Matrices, is highly stable and unmodifiable by experience. The Pearson Product Moment Correlation of .91 between the pre to post experimental administration of the Raven's in the present study would clearly suggest that this test is highly resistant to change. If in addition to being reliable, the Raven's is a valid measure of conceptual ability, then the mean conceptual ability of Ss in the present study ranks in approximately the sixth percentile (\sim 76 IQ). In addition, their mean intelligence, as initially measured by the verbal battery of the Lorge-Thorndike, was 64, better than two standard deviations below the population mean. Thus, as expected, the conceptual and verbal reasoning abilities of Ss in the present research were very poor.

It should also be noted that the Ss scored approximately four percentile or 12 IQ points better on the Raven's than they had initially on the verbal scale of the Lorge-Thorndike. This supports Jensen's (1970) contention that the Raven's is a more culture free measure of the disadvantaged child's intellectual potential than those tests dependent on verbal material. Another disadvantage of using the Lorge-Thorndike, was that it was highly susceptible to what appeared to be practice effects. There was a significant difference ($p < .01$) between the pre and post administration of the test.

Although Jensen (1970) claimed that the development of complex mental abilities was dependent on the development of innate neural structures, he also claimed that the

intellectual strength of the disadvantaged child lay in his fundamental ability to learn. In this regard, he felt that the Digit Span subtest of the WISC was a culture free measure of memory and learning ability. In the present study, the Digit Span subtest was the only measure of intellectual functioning upon which these Ss did not perform far below what would be considered average. Their mean scale score on this test was 8.27. When this scale score is multiplied by the number of appropriately given verbal subtests, an admittedly dubious procedure, the product converts into an 89 IQ. Thus, despite their very poor conceptual skills, their rote learning ability is near average.

In summary, although conceptual skills were not improved by conceptual training, academic achievement skills were. Evidence discussed shows the insensitivity of some testing procedures and the results support the position of Harlow (1949), Leontiev (1957), and Galperin (1957, 1966).

Academic skills have been traditionally measured by both achievement tests and performance in school. Both of these were used to measure academic skills in the present experiment. Contrary to hypothesis one, Ss tutored in academic subjects did not improve their academic skills on either measure significantly more than the untutored Ss. In support of hypothesis five, neither did the untutored group significantly improve their academic skills. In fact, they missed significantly more days of school in 1973-1974 than

they had in 1972-1973 school year. Thus, the Ss who were not given conceptual training did not significantly improve their academic skills.

In support of hypothesis four, Ss given conceptual training did improve their mean grade level on the three tests of the Stanford Achievement battery significantly ($p < .05$) more than did the Ss not given conceptual training (Table 11). They also improved their academic skills on these three tests significantly ($p < .05$) more than Ss tutored in academic subjects (Table 11). However, the fact that Ss given conceptual training were present for significantly ($p < .01$) more hours of tutoring obscures the meaningfulness of this last comparison. The different amounts of tutoring could not have differentially improved academic skills since the conceptual curriculum did not teach them.

It is possible, however, that instead of improving academic skills by improving conceptual skills, the conceptual training had simply improved S's motivation to learn. In support of this idea, it should be noted that Ss in the conceptual group improved their citizenship ratings slightly, missed virtually no additional days of school in 1973-1974, and reduced their time in the Youth Home somewhat more than Ss in the other two groups ($p < .10$).

One explanation for the fact that these Ss did not improve their school grades more than did Ss from the other two groups might be that the grades from Ss having the most problems with school were selectively removed from the

analysis.* This did not happen to any of the Ss from the conceptual group. In fact, one S in the conceptual group came out of a year at Northville State Hospital and succeeded in a graded classroom.

Another explanation for this lack of grade improvement could be that the teacher failed to notice or correctly test S's gains in academic skill. This is not actually so farfetched an explanation. The grading done by teachers is likely influenced by motivation, classroom behavior, personal appearance, ethnic background and study habits (Fishman, et al., 1967). Ss taking part in this study had missed, on the average, one day of school each week and had obtained a mean citizenship rating of 2.26 during the 1972-1973 school year. Twent-four of them were black. Although nothing was known of their study habits, it is clear that they missed a lot of school, were a nuisance when present in class, and were prone to cultural discrimination. Furthermore, it must be remembered that these Ss were court wards and were most probably behavioral problems at home and/or in the community as well as at school.

They were in fact, doing poorly in school. They had received a mean grade point of 1.4 or a "D" average for the 1972-1973 school year. It could even be argued that this mean grade point was inflated relative to S's actual school

*The grades of two additional Ss from the academic group and one from the untutored group were not supplied by the school system for the 1973-1974 school year because they had been placed in ungraded classrooms or were failing to attend school often enough to receive grades (Appendix C).

performance on account of the school's desire to pass them into the next grade for social and administrative reasons. Thus, the teachers had many reasons for giving up trying to teach, choosing to ignore these adolescents, and perseverating in their attitudes towards the youngsters.

Given Ss' improved performance on the Stanford Achievement Test, this appears to be exactly what has happened. If the changes in mean grade level are converted into months, Ss given conceptual training improved their mean grade level by 4.8 months over the three month period of time. Ss tutored in academic subjects lost 0.72 months and the untutored Ss gained 0.84 months over the same time period. Prior to initial testing and from the time they had started school, it was expected, based on their age and mean grade level, that these Ss had been gaining six months in grade level for every school year. However, during the program, the untutored Ss were gaining months of grade level at a little more than half that rate and the Ss in the academic group were actually losing ground. One could conclude from these observations that disadvantaged adolescents are gaining academic skills at an ever slower rate and that conceptual training reversed this process. Thus, hypothesis four was confirmed.

In summary, conceptual Ss' academic skills, as measured by achievement tests, were improved by conceptual training alone. Reasons why these improved skills did not lead to improved grades in school could have been the result

of teacher apathy and the result of the selective removal of Ss with the worst problems from comparison groups of academic and untutored Ss. Since the Ss' academic skills improved and their conceptual skills did not, it can be surmised, that conceptual training provided the essential learning opportunity but that the measures of conceptual ability were not sensitive enough to detect these changes.

There are four main weaknesses to this study.

1. The conceptual curriculum was built on a pragmatic rather than theoretical foundation. In order for others to replicate this experiment and improve on the curriculum it must become more formalized.
2. The 24 hours of conceptual training (maximum feasible under the circumstances) to improve skills which lay relatively undeveloped for 14 years is obviously very little.
3. The measures of academic and conceptual skill were not inherently motivating and free of cultural bias. Ss came in for testing "high" in order to get through what was to them an unnecessary ordeal. Ss were not pre-trained in how to take tests or sufficiently encouraged to do their best.
4. Groups of Ss were not large enough.

However, the fact that under these difficult circumstances it was possible to obtain some improvement in academic achievement level of disadvantaged children via conceptual training without any coaching in academic subjects, together with similar results obtained elsewhere,

may constitute a sufficient encouragement for further research along the same lines.

CHAPTER V

SUMMARY

This study investigated the effects of conceptual training and tutoring on the academic skills of disadvantaged children. The major hypotheses were that:

1. within a highly motivating learning environment, Juvenile Court wards tutored in academic skills would improve their academic skills more than similar Ss in an unseen control group
2. within this same environment, these same Ss would not improve their verbal reasoning and conceptual skills more than those Ss in the unseen control group
3. within this same environment, similar Ss given conceptual training would improve their verbal reasoning and conceptual skills more than the Ss from the two beforehand mentioned groups
4. the Ss receiving conceptual training would improve their academic skills more than the Ss from the two beforehand mentioned groups.
5. the Ss in the unseen control group would not significantly improve their academic, verbal reasoning, and conceptual skills.

The Ss were 30 Juvenile Court wards between the ages of 11 and 17 who were referred for tutoring because of their poor school performance. They were randomly divided up into three groups. One group was given conceptual training, another was tutored in academic skills and the third was not included in the program. Tests were given to the Ss prior to and

following the 12 week, 2 hour a week, tutoring program. The Digit Span subtest of the WISC was used to measure memory or learning ability. The word meaning, paragraph meaning, and arithmetic concept tests from the primary battery of the Stanford Achievement Test were used to measure academic skills. The verbal battery, form 1, level A of the Lorge-Thorndike Intelligence Test and the Raven's Progressive Matrices were used to measure verbal reasoning and conceptual ability. School grades were also used to measure academic skills. Citizenship ratings, school attendance, and days of incarceration were used to measure academic and community adjustment.

The results indicated that the group given conceptual training had improved their academic skills on the Stanford Achievement Test significantly more ($p < .05$) than the other two groups. Although there were trends suggesting that their school and community adjustment had also improved, their school grades had not improved significantly more than the other two groups. Neither had their conceptual abilities' scores. The untutored group had made no significant improvements on any of the measures and the group tutored in academic skills had not improved their academic or conceptual skills significantly more than the untutored group.

It was concluded that conceptual training alone had improved academic skills. Why these improved skills did not lead to improved grades in school could have been

the result of perseveration of teacher attitudes and the result of the selective removal of Ss with the worst problems from comparison groups of academic and untutored Ss. Since the Ss' academic skills improved and their conceptual skills did not, it can be surmised, that conceptual training provided the essential learning opportunity but that the measures of conceptual ability were not sensitive enough to detect these changes.

Appendix A

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Appendix A1

To: Supervisors, Court, and Agency Workers

Re: Saturday Tutoring Program

This is to notify you that we are now accepting referrals for the Clinic's Saturday Tutoring Program. The program will run from 10:00 A.M. to 1:00 P.M. each Saturday, beginning September 29th. Boys and girls between the ages of eleven and sixteen, who need language and academic skills to achieve in school are eligible. In addition to tutoring, there will be a recreational period with a therapeutic emphasis.

We encourage parents to provide transportation for their children, if possible. However, bus tickets will be available if needed.

Referrals can be made by filling out a Clinic referral form (only one copy necessary) and sending it to me. I would appreciate receiving your referrals no later than Friday, September 21st. All referrals to the program must be tested during the week of September 24th. Please contact me at 224-1782 to arrange for a time of testing.

Joseph B. Avore, M.A.
Psychologist

Appendix A2
WAYNE COUNTY JUVENILE COURT

1025 E. FOREST AVENUE
DETROIT, MICHIGAN 48207

TELEPHONE 224-1600



JAMES H. LINCOLN
JUDGE OF PROBATE
JUVENILE DIVISION

SAMUEL L. SIMPSON
REGISTER

ERNEST C. BOTHM
IRA G. KAUFMAN
FRANK S. SZYMANSKI
JOSEPH J. PERNICK
GEORGE N. BASHARA, JR.
JUDGE OF PROBATE

September 13, 1973

Dear Parent:

As you may already know, your child has been referred for our Tutoring Program by his Court worker or State worker. I wanted to take this opportunity to tell you a little more about our program, and to explain how to get to the Clinic for Child Study building where the program is being held.

Our Tutoring Program begins Saturday, September 9, and will continue for the next twelve (12) weeks. The children should be at the Clinic building by 10:00 a.m. on Saturday mornings, and the program ends at 1:00 p.m. College students from the Detroit area will be tutoring your child. During the three hour program, the children will receive two hours of tutoring and one hour of supervised recreational activity.

The program will be located in the Clinic building, which is part of the Juvenile Court complex. The Juvenile Court and Clinic are located at 1025 E. Forest. The Clinic building is on Hancock, between Warren and Forest, directly off the Chrysler Expressway Service Drive.

We are requiring all youngsters for the program to be tested during the week of September 24. The tests will help us to decide what to teach your child. Please call me before Friday, September 21, to arrange the time of testing. My number is 224-1782.

Sincerely,

Joseph B. Avore, M.A.
Clinic for Child Study

Appendix A3
WAYNE COUNTY JUVENILE COURT

1025 E. FOREST AVENUE
DETROIT, MICHIGAN 48207

TELEPHONE 224-1600



ERNEST C. BOEHM
IRA G. KAUFMAN
FRANK S. SZYMANSKI
JOSEPH J. PERINICK
GEORGE N. BASHARA, JR.
JUDGES OF PROBATE

JAMES H. LINCOLN
JUDGE OF PROBATE
JUVENILE DIVISION

SAMUEL L. SIMPSON
REGISTER

September 13, 1973

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Sincerely,

Joseph B. Avore, M.A.
Clinic for Child Study

WAYNE COUNTY JUVENILE COURT

1025 E. FOREST AVENUE
DETROIT, MICHIGAN 48207

TELEPHONE 224-1600



June 18, 1974

JAMES H. LINCOLN
JUDGE OF PROBATE
JUVENILE DIVISION

SAMUEL L. SIMPSON
REGISTER

ERNEST C. BOEHM
IRA G. KAUFMAN
FRANK S. SZYMANSKI
JOSEPH J. PERINICK
GEORGE N. BASHARA, JR.
JUDGE OF PROBATE

Dear

We are doing follow up research on the Juvenile Court's Saturday Tutoring Program.

We need your permission to obtain information from the school and Juvenile Court files. Would you please sign the release of information slips and return them to us in the enclosed stamped self-addressed envelope.

We want to thank you for your cooperation with this program.

Very truly yours,

Joseph B. Avore
Program Director

Appendix A5
WAYNE COUNTY JUVENILE COURT

1025 E. FOREST AVENUE
DETROIT, MICHIGAN 48207

TELEPHONE 224-1600

JAMES H. LINCOLN
JUDGE OF PROBATE
JUVENILE DIVISION

SAMUEL L. SIMPSON
REGISTER

ERNEST C. BOEHM
IRA G. KAUFMAN
FRANK S. SZYMANSKI
JOSEPH J. PERNICK
GEORGE N. BASHARA, JR.
JUDGES OF PROBATE



Re: _____

b.d. _____

I hereby authorize your releasing information from your
files on my _____,
to Janet Shelton and/or Joseph Avore of the Saturday
Tutoring Program, Clinic for Child Study, Wayne County
Juvenile Court.

Signed _____

Address _____

Date _____

Appendix A6

There are fewer tutors taking part in the Tutoring Program than we had expected. Some tutors had to drop out for personal reasons and as a result, we had to eliminate a number of youngsters on a random basis.

However, to determine the effectiveness of the program, your youngster/you will be asked to retake some tests in December for which he/she/you will receive \$3.00. Your youngster/you will also be given first consideration for the next Tutoring Program which will begin in January.

APPENDIX B

1. Academic Curriculum

I. Conglomerate: ENGLISH

A. Subject: Word and Symbol Recognition

Task 1 Word Bingo

Played as a regular Bingo game except the role of caller rotates among the players and words are called (spelled) instead of numbers. The game is divided into eight levels. Levels A and B use letters and consonant blends instead of words. These sets may be played in two ways. The caller may call either the letter itself or a word that begins with that letter or consonant blend.

2 Visual Tracking

A subject will be given a letter or number object set and he must find these letters or numbers in the line below them.

Example: p g
 p b s g r

Available Materials: Letter Tracking I & II
Hidden Numbers

3 Word Tracking

Same as visual tracking except that words are used rather than letters or numbers.

4 Word Find I

Student must locate words hidden in a large body of letters.

Available Materials: How Does a Block
Swallow You Up?
Food
Sweet and Sour
Fight Game
Songs of the Beatles

Word Find II

The words the student must locate from a vocabulary list from a short story which precedes the word find.

Available Materials: Marcus Garvey, Nat Turner,
Sojourner Truth, David Walker
Langston Hughes

- 5 Anagrams
The letters of a word are rearranged. The student must place them back in their original order. There are four levels of difficulty.

Example: rebak break

- 6 Cryptograms
A code is used to write a message of any length. The student's task is to decode that message. Possible codes are on file.

- 7 Word Mine
A word of substantial length is given to the student. He tries to see how many other words he can make using solely the letters of the given word.

Example: CANNABIS

- | | |
|--------|--------|
| 1. can | 6. sin |
| 2. an | 7. bin |
| 3. cab | 8. in |
| 4. ban | 9. as |
| 5. is | |

- 8 Leap Frog
A subject will be given a list of words and he must take the first letter in each of the words and jump it over all the others so that it becomes the last letter, and a new word will be formed.

Example: Plea Leap

B. Subject: Phonetic Skill Task

- Task 1 Word Bingo
See Word Recognition - Task 1 (sets A and B).

- 2 Homonyms
Words that sound the same but are spelled differently. Student is given a list of homonyms and is asked to use them in sentences.

- 3 Rhyming Games
Student is given a word then asked to write or say as many words as he can that rhyme with the given word. May be played in a group (similar to the word game G_H_O_S_T).

- 4 Beginning Letter Games
 Student is given a letter and he must verbalize as many words as he can think of that start with this letter. Task may be complicated for older children by assigning a letter that occurs someplace else in a word other than the beginning. Internal vowel sounds may also be used.

Example: Words whose fourth letter is "r"
 Words whose internal vowel sound
 is like ground i.e round, sound,
 mound

- 5 Heteronyms
 Students are asked to use heteronyms in sentences.

C. Subject: Comprehension

Task 1 Word Choice Stories

Stories are used in which other words are inserted next to existing words of the story. The student is to circle the word that best fits the sentence.

Example: The dove flew gracefully/alike.

Available Material: Albert the Albatross
 S.R.A. Laboratory

2 S.R.A.

3 Reading Comprehension Tests

Available Materials: S.R.A. Laboratory

4 Cross-Word Puzzles

5 Speed Reading Exercises

See the book Improve Your Reading Ability.

D. Subject: Spelling and Grammar

Task 1 Word Bingo
 As in 1A1

2 Visual Tracking
 As in 1A2

3 Syllable Rummy

Played as a regular rummy game but instead of using playing cards the student uses parts of words on cards. Any combination of parts that result in a word is a spread.

4 Scrabble
Regular rules

E. Subject: Composition

Task 1 Open Sentences

A group of sentences are given to the student. Each sentence needs to be completed. The student writes in words to complete the sentence. Sample sentences are on file, tutors may also create their own.

Example: Thomas threw a rock at Lorenzo and ____.

2 Open-Ended Stories

The same idea as open sentences only the story gives the framework for continued expansion of the story line. These stories can be oral or written. A game can be generated with these stories. One student begins a story. Each student must then add something more repeating the preceding story and adding from there. Students are encouraged to be as imaginative as possible.

3 Build a Story

Students are given words and phrases supplied by the tutor, that they must use in a story.

4 Letter Writing I

Tutors ask students to write them a letter. The tutor must then write a letter in response.

Letter Writing II

Students are shown the book 1,001 Things to Get Free and they pick out something they would like to get and write away for it.

5 Writing Topics that Ask Questions

Examples: Write about:

1. ghosts
2. family fights
3. the thing you like best
4. who should die
5. your enemies
6. pirates, killers, and dangerous beasts
7. cars
8. being married
9. someone who should be rich
10. the thing you would most like to blow up

11. what you would do if the world were to blow up in 15 minutes
12. what a backward day is
13. what you would do if you ran the city, were president, were your father.
14. what you would do if you were on a desert island with 20 people, how would you govern it, what laws would you have, how would you enforce them
15. what are the worst things you know
16. what you would do if you ran the T.V. studios, what programs would you show more of, what would you do differently

6Writing Freely

Have the student write whatever he desires, as fast as he can. It doesn't have to make sense, as long as it is fast. Then have contests to see who can write the most words in five minutes.

2Teaching Poetry

Lesson plan on file.

II. Conglomerate: Mathematics

A. Subject: Number Concepts

Task 1 Cusenaire Rods

The Rods are a series of colored sticks. They can be described in terms of their relationship to each other. The blue stick is the same length as 3 green sticks or 9 white pieces. The orange stick is the same length as 2 yellows or 5 reds or 10 whites and so on.

The dark blue stick is not a nine. The number nine is an abstraction. The dark blue stick is concrete. It is simply what it is - a blue stick which happens to be the same length as nine white pieces.

Activity with the Rods for Number Concepts should be centered around showing the relationships between the different lengths of the sticks.

2 Measuring cups and similar utensils
Written examples of the relationships between teaspoon-tablespoon, cup-pint, pint-quart, quart-gallon,

3 Counting to 100 on your fingers
The fingers are used as an abacus with the right hand serving as units (the thumb is 5, and with it up then counting 6,7,8,9 is easy on the one hand) and the left hand as tens (the thumb is 50 and with it up 60, 70, 80, 90 are possible on the one hand).

4 Popsicle sticks to be used for counting

B. Subject: Set Theory

Task 1 Cusenaire Rods

Refer to IIA1 for general concept. Activity for Set Theory should be centered around the relationships between groups of rods and their lengths.

2 Grouping Objects
Xerox copies on file.

C. Subject: Addition

Task 1 Cusenaire Rods

Examples: An orange stick and a red stick is the same as 4 greens, 3 purples, 6 reds, or 12 whites.

2 Bingo

Three levels of difficulty. Tutor draws cards from a deck of addition problems and calls off the combinations, such as, $3 + 4$ and the student must figure out the answer and cover up the correct answer on his or her card.

3 Word Arithmetic

- A. Assign each letter a number (e.g. a=1, b=2, c=3, etc.). The word "bad" would equal 7.
- B. Add words together.
- C. Adding words together can be done on a multitude of levels. e.g. "Make up a sentence equal to 129", or "find a word that equals 42".

4

Verbal and Situational Problems

The advantage of using problems of this type is that numbers are abstracted and many children cannot transfer the concepts to real life situations. Examples of possible problems are, adding up a grocery bill including tax, tabulating the amount of money needed to take buses from one location to another destination, etc. Tutor makes up the problem.

5

Use of the Newspaper

- A. Have kids figure out batting averages, won-lost percentages, field-goal percentage, etc. on favorite players.
- B. Have kids buy stocks or bonds and see how much money they can make. They can sell or buy during the week as long as they keep track and show you their account on Saturday. Give them a certain sum to start with, then, keep track on Saturday of what they earned or lost.

6

Number Mazes

A maze is constructed with different passageways and numbers at each opening. The child is asked what route will yield a particular number. He must then trace a path the passages of which add up to that number. Tutor will make the mazes.

7 Coins
Questions like, "How much is a dime and a nickel?" The questions must use combinations of 1 coin only from each or any denomination.

8 Adding up to 100 on Your Fingers
Same as IIB3.

9 Black Jack or 21
A card game which has one card face down and the other cards face up. The goal of the game is to get cards that come as close to 21 as possible without going over. The player which comes closest to 21 in the least amount of cards wins.

10 Life
A common board game.

11 Monopoly
A common board game.

D. Subject: Subtraction

Task 1 Cusenaire Rods
Example: A green rod taken away from a dark blue is the same as 2 greens or 2 reds or 6 whites. An orange and a red with a green taken away is the same as 3 green or 9 whites. If I have a green and I take away 1 white, how many whites will I have left?

2 Bingo
The same procedures as in IIC2 but the combinations are subtraction problems such as $4 - 3$; etc. There are three different levels.

3 Word Arithmetic
Using the procedures outlined in IIC3, one need only modify this task for subtraction. Thus, one activity might be to subtract words from one another; or, subtract sentences from one another.

4 Verbal and Situational Problems
Use the procedures outlined in IIC4. An example of possible problems might be buying some groceries and tabulating the change.

5 Use of the Newspaper
Same as IIC5.

- 6 Number Mazes
Same procedures as IIG6 but child is asked to trace passages such that when the second and third numbers are subtracted from the first the result is the particular number desired.
- 7 Coins
Questions like "A quarter minus a dime is how much?" The questions must use combinations of 1 coin only from each or any denomination.
- 8 Counting up to 100 on Your Fingers
Same as IIA3 except that child uses fingers to subtract one number from another.
- 9 Subtraction as the Converse of Addition
Subtraction is easier to learn if it is taught as the converse of addition. Adding 5 then subtracting 5 leaves you with nothing. All functions should be taught this way. Multiplication is the converse of division. Borrowing is the opposite of carrying, etc.
- 10 Life
A common board game.
- 11 Monopoly
A common board game.

E. Subject: Multiplication

- Task 1 Cusenaire Rods
Multiplication as multiple addition.
Example: 2 greens or 3 reds is the same as 6 whites. If I put 2 yellows together how many whites will I get?
The problems should always be taken back down to the number of whites left at the end of the problem.
- 2 Bingo
The numbers on the student's Bingo card are chosen by each student. The elements of the multiplication equation are arrived at by some means of chance controlled by the tutor. The object for the students is to pick products that can be arrived at in more than one way.

- 3 Word Arithmetic
Use the same procedures as outlined in IIC3 but adapt them for multiplication. Thus, one would multiply letters, words, and numbers together.
- 4 Verbal and Situational Problems
Use the same procedures as outlined in IIC4. An example of a possible problem might be, "You want to buy 4 candy bars that cost 10¢ each, how much will they cost altogether?"
- 5 Use of the Newspaper
Same as IIC5.
- 6 Number Mazes
Same procedures as IIC6 but student is asked to trace passages such that the product of all the numbers of the passages is equal to the desired number.
- 7 Coins
Questions like "Three dimes, a nickel and 2 quarters is how much?" The questions can use multiple quantities of denominations.
- 8 Multiplication as Multiple Addition
Multiplication is merely multiple addition. A thorough explanation of this, utilizing the Cusenaire Rods, should further the student's understanding of multiplication and addition.
- 9 Multiplication as the Converse of Division
As previously explained in IID3, utilizing the Cusenaire Rods.
- 10 Life
A common board game.
- 11 Monopoly
A common board game.

F. Subject: Division

Task 1 Cusenaire Rods

Division is multiple subtraction.

Example: How many greens are there in a dark blue?
How many greens are there in 9 whites?

III

- 2 Verbal and Situational Problems
Use the same procedures as outlined in IIC4. An example of a problem would be "If you were offered a job which paid \$600.00 every 4 weeks, how much would you be making per week?"
- 3 Use of the Newspaper
Same as IIC5.
- 4 Number Mazes
Same procedures as IIC7 but the number for the first passageway is the divisor and the next number for the second passageway is the dividend. The target number is the quotient.
- 5 Coins
Questions like, "How many dimes in a half dollar?"
- 6 Division as Multiplicative Subtraction
As explained in IID9.
- 7 Division as the Converse of Multiplication
As explained in IID9.
- 8 Life
A common board game.
- 9 Monopoly
A common board game.

III. Conglomerate: SOCIAL STUDIES

A. Subject: Newspapers

- Task 1 Lesson plan called "Newspapers"
- 2 Tasks in file compiled by Detroit Free Press
- 3 Writing your own Newspaper

B. Subject: Maps

- Task 1 Map of Michigan and others as well as tasks in lesson plan called "Teaching the Use of a Map"
- 2 Draw a map of your room, house, neighborhood, etc.
- 3 Draw a map of the place you would most like to live

IIIC

C. Subject: Needed Citizen Skills

- Task 1 Telephone Books
See lesson plan of that title
- 2 Alphabetizing
- 3 Dictionary
See lesson plan of that title
- 4 Tax Forms
Available Material: City, State, and Federal
Tax Forms
- 5 Job Applications
Also related, have role plays using one
student as job interviewer and other
as interviewee.
- 6 First Aid Book

D. Subject: Occupations

- Task 1 Write about if you were a Policeman
- 2 Write about if you were a parent
- 3 Driver's Education Manual

E. Subject: Culturally Relevant Literature

- Task 1 Hurt, Baby, Hurt
- 2 Can't You Hear Me Talking To You?
- 3 J.T.
- 4 African Stories
- 5 A Raisin In The Sun
- 6 "But He Was Cool"
- 7 "Color Me Human"
- 8 "Lead Belly"
- 9 Poems Written By Students

Appendix B

2. Lesson Plan for the Two Hours of Tutoring Provided the Academic Group on Each of the 12 Saturdays Over the Experimental Period.
The Roman Numeral, Letter, Number Identification that Appears in Each Block Refers to Both the Outline and in Many Cases a Pass Out or Work Sheet

Session	1	2	3	4	5	6	7	8	9	10	11	12
High Fun	Making Sense Objects	IA2 Visual Tracking II	IA8 Verbal Leap Frog	IA3 Word Tracking Level III	IA1 Word Bingo Levels A, B, C	IA1 Word Bingo Levels D, E, F	IA7 Word Mine II Letter Games Word Levels I, II Level III	IB4 Letter Games Word Levels I, II Level III	IA7 Word Mine II Letter Games Word Levels I, II Level III	IA5 Anagrams Levels III, IV		
Scale	IA2	IA3	IA3	IA4 II	IC1	IA7	IA6	IC4	IA5	IE2	Used to give	
New										Open-ended Stories	Ss lessons that	
Exercise	Visual Tracking I	Word Tracking Level I	Word Tracking Level II	Word Tracking Level III	Word Mine Level I	Word Mine Level I	Cryptography	Crossword Puzzles	Anagrams Level I, II			
Writing	IE3 Build a Story	IE5 Writing Topics that Ask Ques.	IA4 I Word Find I	IE5 Writing Topics that Ask Ques.	IE4 II Letter Writing II	IE4 II Letter Writing II	IB2 Homonyms	ID3 Syllable Rummy	ID3 Syllable Rummy	IE7 Teaching Poetry	they may	
Social Studies and Literature	IIIE1 Hurt, Baby, Hurt	IIIE1, 5, 6, 8, 9 Literature Letter Writing II Where you Want to Live	IIIE1, 9 Letter Writing II Literature	IIIE1, 2, 3 Maps, Room, House	IIIE1, 2, 3 Newspapers; Literature	IIIE1, 2, 3 Alphabetizing; Telephone Books	IIIE1, 2, 3 Dictionary; Word Find II	IIIE1, 2, 3 First Aid Book	IIIE1, 2, 3 Job Application; Literature	IID3 Driver Education Manual	have missed or	
Math	IIIC7 Coins for Addition	IIIC6 Number Mazes for Addition	IIIE8 Multiplication as Addition	IIIE2 Multiplication as Addition	IIIE1 Multiplication	IIIE1 Subtraction	IIIE1 Subtraction	IID2 Subtraction	IIIF6 Division as Converse of Multiplication	IIIF6 Division as Converse of Multiplication	Complete	
Cuisenaire Rods	IIIA1; IIB1 Number Concepts; Set Theory	IIIA1; IIB1 Number Concepts; Set Theory	IIIC1; IIE1 Addition; Multiplication	IIIE1 Multiplication	IIIE1 Multiplication	IIIE1 Subtraction	IIIE1 Subtraction	IID1 Subtraction	IIIF1 Subtraction	IIIF1 Subtraction	Previously	
Application	IIIB2 Grouping Objects	IIIC3 Word Arithmetic for Addition	IIIE3 Word Arithmetic for Multiplication	IIIE2 Multiplication	IIIE4 Verbal and Situational Problems for Mult.	IIIE4 Word Arithmetic for Subtraction	IID2 Subtraction	IID4 Verbal and Situational Problems for Subt.	IIIF2 Verbal and Situational Problems for Div.	IIIE1; IIIF1 Rods: Subt.; Division		
Verbal, Situational Problems and Games	IIIC6; IIA2 Number Mazes for Add.; Measuring Cups	IIIC4; IIC7 Verbal and Situational Prob. for add.; Coins for Mult.	IIIE4 Verbal and Situational Prob. for Mult.	IIIE7; IIIE6 Coins for Verbal and Situational Prob. for Mult.	IIIE10 or 11 Life or Monopoly	IIIE4 Verbal and Situational Prob. for Subt.	IID7 Coins for Subt.	IID10 or 11 Life Monopoly	IIIF4 Number Mazes for Division	IIIE4; IIIF2; 3 Verbal and Situational Prob. for Div.		

APPENDIX B

3. TABLE OF CONTENTS FOR CONCEPTUAL CURRICULUM

I. Symbolism

- 1A Language and pictures as symbols
- 2A Mapping the room
- 1B Abstract symbols
- 2B How we acquire symbols in our life
- 1C Algebra
- 2C The secret message

II. Similarities

- 1A Abstract versus concrete
- 2A General and specific
- 3A₁ General and specific
- 3A₂ General and specific concentration
- 4A Relationships between objects
- 5A Relationships between objects
- 1B Which is the most descriptive label
- 2B Relation between objects
- 3B Forced relation between words

III. Sets and Subsets

- 1A Find and explain the one that doesn't belong
- 2A Word groupings
- 3A Tape-recorded sounds
- 4A Random words
- 5A Objects
- 1B Subsets

IV. Analogies

- 1A Two words per card: analogy concentration
- 1B Mathematical proportions
- 1C Relationship analogy

V. Language Logic

- 1A Logic rummy
- 2A Logic sentences
- 1B Concentration: opposites
- 1C WFF and Pruf
- 1D Concentration: similarities

VI. Inductive Thinking

- 1A What is going to happen...
- 1B What if...
- 2B. What wouldn't be...
- 3B What would things be like...
- 4B What would things be like...
- 5B What wouldn't be here...
- 1C Progression, What is a...
- 2C Progression exercise
- 3C Progression exercise
- 4C Comic Progression

VII. Deduction

- 1A Logic statements and conclusions
- 2A Problem jobs and mysteries (2 sheets)
- 3A Logic problems (3 sheets)
- 1B Guess a card - Guess a number
- Checker board space, Battleship, Twenty Questions

VIII. Graphing

- 1A Graphing one dimension
- 2A Graphing two dimensions
- 3A Bar graph reading
- 1B Evolution versus revolution
- 2B Freedom versus relativity

IX. Complex Problem Solving

- 1A Words that are cool
- 2A What is a glop?
- 3A Allowed - Don't
- 4A What is a Yang?
- 5A What is a Ying?
- 1B Game analysis
 - Tic-Tac-Toe, Dots and Lines, Monopoly
- 2B Prisoners'Dilemma
- 3B Mathematic dice game

X. Natural and Numeric Laws

- 1A Conservation with water
- 2A Conservation with clay
- 1B Addition as the converse of subtraction
- 2B What is addition? What is subtraction?
- 1C Bread mold
- 2C Pendulum problems
- 3C Cube problems

XI. Reading

- 1A Zen stories
- 1B What's the difference I
- 2B What's the difference II
- 1C Write a story

Appendix B

4. Lesson plan for the Two Hours of Tutoring Provided the Conceptual Group on Each of the 12 Saturdays Over the Experimental Period
The Roman Numeral, Letter, Number Identification that Appears in Each Block Refers to Both the Outline and in Many Cases a Pass Out or Work Sheet

SESSION	1	2	3	4	5	6	7	8	9	10	11	12
Low Group	Simil. Sets Complex Problem Solving (Tic Tac Toe Dots)	2A Sets, 1A Language Logic Graphing 1B Natural Laws Induc.	2A Symbols 1B Language Logic Induc. 2A Deduc. 2C Complex Problem Solving	1A Induc. 2A Deduc. 1B Graphing 1B Language 1A Logic Complex Problem Solving 4A	2B Symbols 3B Deduc. 1B Simil. 4B Analogy 1B Complex Problem Solving 3A Graphing 2A	2C Sets 1C Deduc. 3A Analogy 4B Complex Problem Solving 3A Graphing 2A	1B Simil. 1B Analogy 2A Language 1A Logic Induc. Deduc. 1B Solving Natural Laws	1B Simil. 1A Sets Language 1A Logic 4B Complex Problem Solving 1B Solving Natural Laws	2B Symbols 4A Sets 1C Induc. Deduc. 3B Natural Laws 1C Reading 1A	1C Symbols 2A 1C, 2C 1B Induc. 2C Deduc. 4C Complex Problem Solving 1B Problem Solving 2C	1B Symbols 1C, 2C 5B Language 2A Logic Natural Laws 1B Laws 2B Laws 3B	1B Complex Problem Solving
Medium Low Group	Simil. Sets Induc. Complex Problem Solving (Dots)	2A Simil. 1A Sets 2A, 5A 1B Graphing Complex Problem Solving (Tic Tac Toe)	2A Symbols 1A Simil. Induc. 1B Deduc. Complex Problem Solving	2A Simil. 1C 3A Language 2B Logic 2C 2A Induc. Deduc. 1B, 1A	1B Symbols 2B Language 1C Logic 1D Induc. 4B Deduc. 1B, 1A Complex Problem Solving	1B Sets 2B Analogy 1A Language 1C Logic 1D Induc. 1B, 1A 1B, Graphing	4A Symbols 1B Simil. Language Logic Complex Problem Solving Graphing Natural Laws	2B Sets 4A Language 5A Logic Induc. 1C Deduc. 2A, 3A 1B Complex Problem Solving 2B Problem Solving Graphing Natural Laws	4A Sets 1A Induc. 5B 1C Complex Problem Solving 1A, 3A Natural Laws 2B, 3B Reading 1A	5A Symbols 1C 2C Sets 4C Language Logic Deduc. 2B Complex Problem Solving 2C, 1B Solving 2B, 3B Reading 1A	1A Symbols 1B Natural Laws 4A Language 1A Logic 1A 2A	2C Analogy
Medium High Group	Simil. Sets Language Logic	2A Sets 1A Complex Problem Solving (Tic Tac Toe Dots)	2A Symbols 1A Simil. Language Logic Induc. Deduc. Complex Problem Solving	2A Simil. 1C Complex Problem Solving 1B Analog 2C Analog 2A Induc. Deduc. Complex Problem Solving	1B Symbols Sets Induc. 1A Deduc. 2A Complex Problem Solving 1B Natural Laws	1B Sets 5A Language 2B Logic 1A Induc. 1B Deduc. 1A 2A 1B Natural Laws	Symbols Sets Induc. Deduc. Natural Laws	2B Symbols 4A Language 4B Logic 1B Induc. Deduc. 2C 2A, 3A Graphing Natural Laws	1A Sets Induc. 1A Deduc. 5B Reading 1A 2A, 3A Graphing Natural Laws	4A Graphing 4C Complex Problem Solving 1B Problem Solving 1A Solving 1B 5A Natural Laws	3A Symbols Induc. Language 3A Logic 4A 5A Natural Laws	2C Language 2C Logic Analogy 1A 2A 1B 3C
High Group	Simil. Sets Language Logic	2A Simil. 1A Sets 1C Graphing Complex Problem Solving (Tic Tac Toe Dots)	1A Symbol: 1A 2A Analogy 1A Induc. Language 1B Logic Complex Problem Solving 1B Logic Complex Problem Solving Natural Laws 2A Problem Solving (Tic Tac Toe Dots)	1A Simil. 1C Language 1A Logic 1B Deduc. 2C Complex Problem Solving 1C Solving 1C Natural Laws 1A Solving 4A	1B Symbols 1C Language 2A Logic Deduc. Complex Problem Solving 1B	2A Simil. 2B Sets Language 1A Logic 1B Induc. 1B Deduc. 3A Complex Problem Solving	Symbols Sets Induc. Deduc. Deduc. 2A, 3A, 1B Natural Laws	2A Simil. 4A Language 1B Logic 1C 2B Graphing 1A Reading 2A, 3A, 1B Natural Laws	1A Simil. 4A, 5A Induc. 4C 1A Induc. 1C Language 2A Logic 1A 2C	3A Sets 4A, 5A Induc. 4C 1A Induc. 1C Language 1B Reading 1B Reading 1A Language Logic	5A Symbols 4B Natural Laws 5B Laws 3A Graphing 1A Reading 1A Language 2A	1B Analogy 1B Complex Problem Solving 2B Problem Solving 3B Solving

Appendix B

5. Conceptual Curriculum Pass Out Sheets

SYMBOLISM

Discussion

Language and pictures as symbols

Draw the word "chair" on the board.
Ask the class "What is this?"

Draw a picture of a chair on the board.
Ask the class "What is this?"
"How is this different from what I drew before?"
"When would you use one and when would you use another?"
"What is the difference between a picture and a word?"

Point to a chair and ask, "What is this?"
"Why is it different from the picture or the word?"
"How did the picture and the word "chair" come about?"
"Why were they invented?"

Write the word "three" on the board
Ask "What is this?"
If someone says "three" ask, "Three what?"
"Is there anything that's three what?"

Write the numeral "3" on the board.
"What is this?" "Is this three and is that three?" "What is it needed for?" "Are there other ways of writing or signifying three" Show me them."

"Before there was a real thing called "a chair" for the word "chair" and the picture, is there a real thing called "the number three" for the word and symbol?"

Why?

SYMBOLISM

Mapping the room

If you had to draw a map of this room, how would you do it? How would you symbolize the desks? How would you symbolize the chairs, how about the doors, the windows? Would you put people in your map?

Draw a map of your room at home.

Starts as a Discussion

Raise a clenched fist up into the air: "What does that mean?" "Who used it?" "Anybody else?" "Has a clenched fist always been used for power?" "How long ago?" "Have you ever seen anyone in a cowboy movie use it?" "Why has it just been used recently?"

Draw a peace sign on the board: "What is this?" "What does it mean?" "How long has this been used?" "Why has it just been used recently?" "What brought about the use of a peace sign?" "Is there another symbol for peace?" "Who uses the peace sign?" "What group is it characteristic of?"

Raise a middle finger: "What does that mean?" "Who uses it?" "Why is it used instead of telling a person to fuck off?" "In what situations is it used?"

"What does the American Flag look like?" "When do people make you salute the flag?" "When do people make you sing the national anthems?" "Why in these places?" "Why when people are angry at the United States do they burn the flag?" "Is burning the flag like burning the country?" "Why is it against the law to destroy an American flag?" "Why do many young people make clothes out of American flags?"

"Suppose you made a flag that didn't look like the American flag and you called it an American flag and burned it in front of a policeman. "Could you be arrested?" "Why not?" "Suppose you gave the finger to someone who didn't know what it means, would he be angry?" "Why not?"

"In order for something to stand for something, how many people have to accept?"

Ask the following questions to your class:

"Draw me a symbol for the word "crowded". "Can someone draw me another one, another?"

Draw me a symbol for the word "crowded" using just circles.

Draw me "something that is "empty". Another way. Another way. Which way do you like the best?

Draw me a symbol for "hot". Another?

Continued.

Draw me a symbol for "solid", "scattered", "love", "hate".

Draw me a symbol for "touching" using "circles", "squares", "hands".

Draw me a symbol for "conflict or fighting" using two arrows.

Draw me a symbol for "a system or a cycle" using arrows.

Ask me to draw you some symbols.

SYMBOLISM -

How we acquire symbols in our life

"What do you think about when you see a policeman? Why? When do you see a policeman? What has happened usually when a policeman is called? Do policemen ever come around when things are all right? If every time you saw a policeman he gave you \$5.00, what would you think of policemen then? What if everytime you saw a policeman he gave you something to eat, or a ride home. What would you think about policemen then? What do policemen symbolize? How did they get to symbolize that in your life?"

"What do you think about when your teacher tells you that you're going to have a test? Why? What happens each time you take a test? If you got 100% each time you took a test, do you think you would hate taking tests? If every time someone said you're going to have a test they brought out ice cream while they gave the test, would you hate tests as much? How did you get to hate tests.?"

"What do you think about when you come to this clinic on Saturdays. What if every time you come to this building people yelled at you. What if they accused you of doing things and made you feel bad. What if they embarrassed you in front of everyone else. What if they didn't like you. How would this building be different from school? What did you think of this building the first week? What do you think of it now?"

What are some other things in your life that acquired some kind of symbols? Explain how they acquired that kind of value.

SYMBOLISM -

Algebra

$$a = 3 \quad b = 7$$

$$a+b=$$

$$2xa+b=$$

$$b-a=$$

$$3-a=$$

$$a=4 \quad b=10 \quad c=4$$

$$b+c-a=$$

$$b.a=$$

$$a-c=$$

$$b-c-a=$$

$$b-(C+z) =$$

$$2b-c =$$

$$a=4 \quad b=? \quad c=?$$

$$a+b = 10$$

$$c.b = 30$$

$$c-a = 1$$

$$5+c = 10$$

$$2xb-c = 7$$

$$\begin{matrix} 14 & o & o \\ a = & b = & c = \end{matrix}$$

$$b=c$$

$$a+c=a$$

$$a=7 \times 2$$

$$\begin{matrix} ' & ' & ' \\ e = & f = & g = \end{matrix}$$

$$3xe = 3xf$$

$$3f = 3g$$

$$e+f+g = f+2$$

$$g + 2+e = 2xce+f$$

$$\begin{matrix} 11 & 7 & 3 \\ \square & \Delta & o \end{matrix}$$

$$\begin{matrix} \square + 7 = 18 \\ \square = \Delta = \square + 7 \end{matrix}$$

$$7 + 0 = \square - 1$$

$$\begin{matrix} 7 & 6 & 5 \\ A = & Z = & S = \end{matrix}$$

$$S+Z = 1 + 4$$

$$1 + S = 2xZ$$

$$2+s+z = 2+1$$

SYMBOLISM

I 20

The secret message - Decode

□ = the

3 = fat

▽ = man

Z = got

D = Charlie

○ = in

□□ = chest

N = see

└ = run

U = he

+ = dead

□ 3 ▽ Z D
 U Z D ○ □ □
 N □ 3 ▽ └
 D +

A = ain't

B = you

C = got

D = no

E = sense

F = man

G = any

H = black

A B C D E F

A B C G E F

A B H F

B H

F = I

1 = can't

11 = see

3 = man

∩ = find

11 = anything

2 = to

L = me

F 1 11 F 1 11 11

∩ L 3

SIMILARITIES

SATURDAY TUTORING PROGRAM

Teaching Unit #2

Abstract and Concrete

Materials Needed: 1 1/2" square cube of styrene plastic in which a Medici globe has been encased - or any curio which can be held in the hands.

Maximum Time: 15 minutes

Purpose of Lesson: To demonstrate to the students the difference between abstract and concrete; to lead into other exercises which reason from CONCRETE ← or → ABSTRACT.

Exercise #1 (3-5 minutes)

- A. Explain definition and differences between abstract and concrete. Using a commonly known object (e.g. a pair of glasses, a paper clip, a chain, etc.), give an example of it's concrete definition and an abstract definition.
- B. Pick a common object in the room and ask each student to give an abstract and concrete definition for it. (Give one token.)

Exercise #2 (3 minutes)

Ask each student to examine the globe and write a short concrete definition of the object, telling as many physical characteristics about the object as he can. (Give one token.)

Exercise #3 (3 minutes)

Ask each student to write a short abstract definition of the object. (Give one token.)

Exercise #4 (5 minutes)

Ask each student to give a "story type" abstract ORAL presentation on the object (e.g. "how did the globe get into the plastic cube?") Try to limit the presentation to 30 seconds - 1 minute, begin by giving a sample presentation. (Give one token.)

The lesson demonstrates to the student the difference between abstract and concrete, and shows him the simplest tools of working with the two concepts. It encourages both factual objectivity and creativity, and shows that the two are not unrelated. (The creative narrative that a space monster captured a planet, shrunk it, and encased it in plastic, is not unrelated to the fact that the object at hand is a small globe in a block of plastic.

Within the framework of this basic and introductory level, the teacher can move a class to all sorts of mental gymnastics in combination with writing and oral presentation.

SIMILARITIES

General and specific

Indicate which of the words in each exercise is the most specific. May be done verbally or as written work

- | | |
|---------------------|---------------------|
| 1. Insect | mosquitos |
| 2. drugs | heroin |
| 3. cities | Detroit |
| 4. state | California |
| 5. guitarists | Jimi Hendrix |
| 6. men | Martin Luther King |
| 7. crayon | writing tool |
| 8. hammer | tool |
| 9. my dog | dog |
| 10. dogs | German Shepherd |
| 11. money | 58¢ |
| 12. cloud | dark cloud |
| 13. Strohs | beer |
| 14. Ripple | wine |
| 15. police | Stress |
| 16. Woodward | street |
| 17. high school | Mumford High School |
| 18. Hudson's | store |
| 19. bodies of water | Detroit River |
| 20. mailbox | my mailbox |
| 21. book | dictionary |
| 22. comic | Superman |
| 23. vampire | Dracula |
| 24. Black Panther | Bobby Seale |

SIMILARITIES

General and specific

Indicate if the following words are general
or specific. May be written or done verbally

1. Malcolm X
2. men —
3. baseball
4. my baseball
5. the planet earth
6. my finger
7. his cigarette
8. Marlboro
9. their dog
10. T.V. show
11. movie
12. Sounder
13. Youth Home
14. prison
15. Dehoco
16. knife
17. Kent's knife
18. swear
19. money
20. girl
21. Barbara
22. parent
23. my father

SIMILARITIES

II 4A

Teaching the ability to decide if one object falls into the domain of others. Indicate if one word falls into the domain of the other

- | | |
|----------------------------|--------------------|
| 1. fruit | watermelon |
| 2. people | jackrabbits |
| 3. people | white people |
| 4. bubble gum | Bazooka Joe, gum |
| 5. candy | apple |
| 6. children | boys |
| 7. name of a girl | John |
| 8. shoes | gym shoes |
| 9. clocks | watches |
| 10. bank | city national bank |
| 11. color | red |
| 12. grass | green |
| 13. clothes | pants |
| 14. furniture | sofa |
| 15. game | football |
| 16. children | son |
| 17. people | uncle |
| 18. things that give light | sun |
| 19. Michigan | Detroit |
| 20. things that are alive | rock |

For each of the following words, give a word that is more general, and a word that is more specific

1. balloon
2. ice cream
3. wine
4. snow
5. gun
6. dictionary
7. fruit
8. bacon
9. car
10. chair
11. foot
12. run
13. girl
14. musician
15. television
16. newspaper
17. soap
18. silverware
19. beer
20. cigarette

SIMILARITIES

Teaching the ability to find the most descriptive labels

1. pen, pencil, crayon
 - a. things that are long
 - b. things that are long and pointy
 - c. things that one writes with
2. Malcolm X, H. Rap Brown
 - a. men
 - b. black men
 - c. black men who advocate violent revolution
3. penny, nickel, quarter
 - a. things that are round
 - b. coins made of white metal
 - c. coins
4. Kurt, Kevin
 - a. names
 - b. boys names that start with K
 - c. boys names
5. teacher, principal
 - a. people who yell at you
 - b. people who have jobs
 - c. people who work in schools
6. mother, father
 - a. parents
 - b. people that live with you
 - c. people
7. hit, kick
 - a. words
 - b. words that have to do with fighting
 - c. words that have to do with touching someone
8. reefer, joint
 - a. names of drugs
 - b. names of a marijuana cigarette
 - c. names for marijuana
9. pig, cop
 - a. police
 - b. people who mess with you
 3. police who mess with you

10. snow, rain
 - a. weather
 - b. winter weather
 - c. weather that comes down from the sky
11. o, O
 - a. round objects
 - b. circles
 - c. circles that are the same
12. shirt, jacket
 - a. clothes
 - b. things made of cloth
 - c. clothes you wear around your shoulders
13. beer, wine
 - a. liquids
 - b. liquids that get you high
 - c. liquids that are made from alcohol
14. cow, pig
 - a. animals
 - b. animals you find on a farm
 - c. animals you get meat from
15. pusher, junkie
 - a. people who live in cities
 - b. people who buy and sell smack
 - c. people who are addicted to heroin
16. T.V., radio
 - a. appliances that work from electricity
 - b. things that you listen to
 - c. things that entertain
17. chair, table
 - a. things in the home
 - b. things you sit on when you eat
 - c. furniture
18. cake, cookies
 - a. food
 - b. things you eat
 - c. deserts
19. coke, pepsi
 - a. liquids

- b. things you drink
- c. pop

20. school, church

- a. places
- b. places your family makes you go to
- c. places where you sit and listen to somebody talk

SIMILARITIES
RELATIONS BETWEEN OBJECTS -

II 23

What relationships do the following objects
have with each other?

1. Afro-American	chinese
2. telephone pole	tree
3. sink	toilet
4. robin	pigeon
5. rug	floor
6. inch	foot
7. two	four
8. pot	pan
9. girl	women
10. curtains	window shade
11. mirror	window
12. black	red
13. tree	flower
14. cup	glass
15. man	snake
16. worm	apple
17. floor	ground
18. balloon	orange (fruit)
19. mustache	beard
20. California	Michigan
21. ear	nose
22. kick	foot
23. minute	inch

SIMILARITIES
Forced Relationship Between Words

The harder a person has to stretch to find a relationship between two words, the more thinking that is done. Pick any two words and have the child force a connection between them.

Find the one that doesn't belong, explain why you made that choice --- can be done verbally or written

1. flower, grass, tree, motorcycle, shrub
2. cigarette, cigar, apple, pipe
3. chair, desk, table, bed, rabbit
4. orange, apple, watermelon, steak, banana
5. dog, cat, whale, squirrel, chipmunk
6. nickel, dime, quarter, dollar bill, penny
7. nickel, dime, quarter, penny
8. pencil, pen, magic marker, notebook
9. electric guitar, bass guitar, folk guitar, piano
10. piano, trumpet, musician, bass guitar
11. Wilt Chamberlin, Lew Alcindor, Dave Bing, Martin Luther King
12. Woodward, East Forest, Chrysler Freeway, Cobo Hall
(size)
13. elephant, house, railroad car, a small stone
(color)
14. blood, ketchup, stop sign, grass
15. Christmas, Saturday, Easter, Labor-day
(milk products) (what you would eat at a birthday party)
16. Ice cream, milk, cake, cheese
17. knife, gun, bullet, club
18. baseball, football, bat, basketball
(movement)
19. run, jump, hop, stand
(3 letter words)
20. sit, cat, hop, see, encyclopedia
21. house, apartment, grocery store, bus
(senses)
22. car, rose, eyes, foot
(heat)
23. radiator, stove, heater, fire, washing machine

24. David, John, Ernest, Mary, Sam
25. David, John, Debby, Donna, Denise
26. Chevrolet, Mustang, Volkswagon, car
27. he, she, Tom, me
28. toilet, shower, bath, stove, sink
29. money order, check, dollar bill, wallet
(paper)
30. newspaper, notebook, lottery ticket, pencil
31. boot, shoe, glove, sock
32. salt, pepper, sugar, bacon
33. cop, policeman, mayor, pig
34. honkey, cracker, black, whitey
35. Catholic, American, Jew, Baptist
36. smell, cat, stink, odor
(vocal)
37. sing, run, talk, swear
38. (m) (states)
Montana, Michigan, Alabama, Mexico
39. Sanford and Son, Mod Squad, All In The Family, 11 O'clock news
40. television, radio, telephone, phonograph
(Detroit T.V. Stations)
41. Channel 2, Channel 4, Channel 7, Channel 9

Directions: In each of the following exercises,
there are at least two word group-
ings. Distinguish them and justify
your choices.
May be done verbally or written

1. shoes, socks, tag, shirt, cat, rat, pants, cow
2. ears, nose, baseball, bat, throat, double play, mit
3. beer, whiskey, steak, wine, bacon, hamburger, ham
4. cup, plate, floor, ceiling, wall, bowl, glass
5. car, bat, bus, bag, motorcycle, train
6. donut, ball, life preserver, cheerios, bat, box
7. encyclopedia, rat, dictionary, moose, hamster, phonebook
8. sun, trees, houses, moon, lake, stars
9. canteen, pencil, glass, pen, magic markers, paper cup
10. Curt, Claudia, Kevin, Karl, Cecilia, Karen
11. father, uncle, mother, aunt, cousin, sister, brother
12. hot, eat, chew, warm, swallow
13. kiss, smile, hug, touch, laugh, happy
14. pray, school, teacher, church, weekday, Sunday
15. marijuana, beer, whiskey, heroin, L.S.D., wine
16. life, death, born, old man, die, baby
17. free, happy, slave, junkie, liberated, chains, black, white
18. right, truth, power, wrong, evil, strength
19. measure, inch, foot, yard, minute, second, hour
20. pig, jig, put, place, dig, set down
21. school, teacher, warden, student, prison, prisoner
22. important, poor, nothing, rich, welfare, big house
23. women, sex, home, man, job, big car
24. mother, love, father, punish, home

SETS AND SUBSETS

Tape recorded sounds. See tape
marked Set Theory

1. 3 loud - 1 soft
2. 3 chord - 1 single
3. 3 animal sounds - 1 human
4. 3 metal clicks - 1 wood
5. 3 high notes - 1 low
6. 3 whole notes - 1 quarter

SETS AND SUBSETS

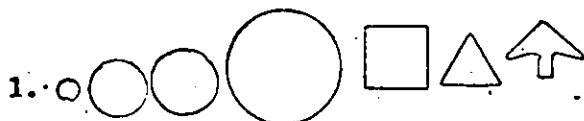
Any conglomerate of words and objects may be classified into a set. The more random the selection of the words, the more a person has to stretch, in order to make connections between them.

In this exercise, the tutor is asked to pick six or seven words of random and have the student make connections between them.

SETS AND SUBSETS

To be done with eyes closed. Objects assembled in individual plastic bags.

1. Three soft objects - one coarse.
2. Three flat objects - one bulky.
3. Three objects with defined sides - one irregular.
4. Three malleable objects - one rigid.
5. Three metal objects - one stone.
6. Three wood objects - one other.
7. Three plastic objects - one other.
8. Three round objects - one square.
9. Three long objects - one short.
10. Three animal shapes - one non-animal shape
11. Three pennies - one dime.



1. mouse, animals, rat, mice, dogs
2. blood, orange juice, lemonade, red pop, tomato juice
3. truck, chevrolet, Cadillac, Ford, bus, car.
4. train, plane, helicopter, bus, truck
5. sink, toaster, shower, oven, toilet, frying pan
6. newspaper, comic section, sports section, front page, radio, TV
7. penny, nickel, dollar bill, ten dollar bill, quarter, money
8. writing materials, pen, paper, crayon, pencil
9. musical instruments, bass, electric guitar, trumpet, drum
10. Stevie Wonder, Rolling Stones, Jackson 5, The Beatles, Roberta Flack
11. red, green, dark red, light red, blue, yellow
12. television, Sanford and Son, Mod Squad, Radio, All in the Family, stereo
13. Movie,, Shaft, Superfly, Sound Of Music, Sounder
14. Frankenstein, Dracula, Werewolf, Monsters
15. David, Jay, John, Sam, Kent, Jessie
16. Alabama, Montana, Arkansas, Alaska, Georgia
17. 10:00 a.m., 7:30 a.m., 6:15 a.m., 9:00 p.m., 10:30 p.m., 8:00 p.m.
18. 1, 2, 7, 8, 11, 20
19. 3a, 7a, 11a, 4a, 8a
20. 0, 0, 0, 0, 0, 0

ANALOGY -

MATH PROPORTIONS

- A. 1 is to 2 as 5 is to _____
- B. 2 is to 4 as 5 is to _____
- C. 3 is to 6 as 1 is to _____
- D. 7 is to 14 as 4 is to _____
- E. 2 is to 3 as 4 is to _____
- F. 1 is to 3 as 2 is to _____
- G. 6 is to 3 as 4 is to _____
- H. 7 is to 1 as 14 is to _____
- I. 1 is to 1 as 9 is to _____
- J. 1 is to 3 as 7 is to _____
- K. 5 is to 15 as 3 is to _____
- L. 6 is to 9 as 2 is to _____

Analogy seems to be a very difficult task to grasp. More concrete representations such as cusenaire rods, the use of a picture of a pie or other graphic examples might serve as a lead-up to this exercise.

ANALOGY -

RELATIONSHIP ANALOGY

Object: To use the concept of analogy to improve a student's perception of interpersonal relationships.

Task: The person is given a set of very general examples of relationships and then asked to fill in two persons that he knows whose relationship is similar to those general relationships given.

1. Father is to son as _____ is to _____
2. Brother is to brother as _____ is to _____
3. Man is to woman as _____ is to _____
4. Winner is to loser as _____ is to _____
5. One is to many as _____ is to _____
6. Strong is to weak as _____ is to _____
7. Enemy is to enemy as _____ is to _____
8. Lover is to lover as _____ is to _____
9. Boss is to employer as _____ is to _____
10. Old is to young as _____ is to _____
11. Leader is to follower as _____ is to _____
12. Loud is to quiet as _____ is to _____

LANGUAGE LOGIC

LOGIC SENTENCES

Object: To teach the use of the language quantifiers

Always, Never, Sometimes, and Average

Task 1: Teacher creates sentences using the words: always,
Sometimes, never, and average and students decide
their validity.

Examples: People always smile
Dog sometimes bark

Task 2: Students make up their own sentences and decide amongst
themselves which are valid or invalid.

What is going to happen tomorrow?

What is going to happen in one hour?

What is going to happen in five minutes?

How do you know?

If you know three black/white people who are lazy, are all black/white people lazy? Most? Majority? Some? Few? None?

If you get an answer wrong, does this mean that you will get every answer wrong? Does it make you feel as if you will? Why should it?

Why do you say I'm wrong instead of I've made a mistake.

INDUCTIVE THINKING - 1B

Discussion

What would be the consequences if water did not freeze at 32°F . What if water did not change to ice at a low temperature. What would be different? What wouldn't exist anymore? What kind of problems would we have? List as many things as you can which people would be out of business. How could we keep things cold?

INDUCTIVE THINKING

What wouldn't be as we know it if there was no wood? What things wouldn't be here? What would be here but what would be changed? How many things can you think of that are made out of wood? What would we use instead?

What other questions can you add?

INDUCTIVE THINKING

What would things be like if there were no families?

How would children be raised if there were no families?

Who would have children?

Who would take care of the children?

Where would they live?

What would two people who loved each other do instead of getting married?

What things wouldn't you have that you have now?

Who would you be related to?

INDUCTIVE THINKING

What would things be like if there was no language?

How would people communicate with each other?

What are other ways of communicating?

Name other ways that language can be used:

What would we lose if we didn't have language?

INDUCTIVE THINKING

What wouldn't be here if every one was the same?

Would people like each other more?

What if everyone was the same color.

What differences wouldn't there be anymore?

What are some of the problems we would get rid of?

What are some of the problems we would have?

ANALOGICAL THINKING
PROGRESSIONS

VI 10

Draw one of the following sequences on the board

LEVEL I

a, b, c, d, _____

1, 3, 5, 7, _____

□, □, □, _____

LEVEL II

a, e, i, o, _____

1, 5, 9, 13, _____

□, □, □, □, _____

LEVEL III

A B C D E F G H where does I go

a, to, fat, cool, these, _____

1, 4, 9, 16, 25, _____

Offer a token to anyone who can fill in the blank. After all three tokens are given out, offer a token to anyone who can tell you why a blank was filled as it was. Ask what is common to all three examples. If response is as clear as you would wish, reward. If response is not clear, ignore it. In either case, continue by offering a token to anyone who can write a progression, leaving out its last components. Give a token to another person who can fill it in.

You can continue this as long as it seems necessary. Remember, creative behavior can be programmed so if the progressions get too redundant, say for example, if all the progressions are,

numeric, offer tokens for non-numeric progressions. Progressions using symbols, words, etc., rewards at this time should be placed on those who initiate the progressions rather than those who complete them.

If stagnation begins, introduce the following form of progression.



and have the child fill in the last sequence. All comics are progressions. Ask again what all these examples have in common. A really good answer may be rewarded. Another possible step is to tell a story and have them guess the ending, e.g., Jimmy knifed this dude on the street, while he was running away, he was caught by a stress officer....what happens next? You'll probably get two or three really interesting endings. Ask how this relates to everything else you were talking about.

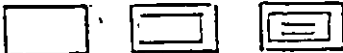





Another tangent, compare your life to a progression, how what you did in the past affects the present and the future. You get good grades in high school so you can be accepted in college, to get good grades so you can get into graduate school so you can get an interesting job which doesn't mean anything anyways because you can't. Ask again how this relates to what was previously said.

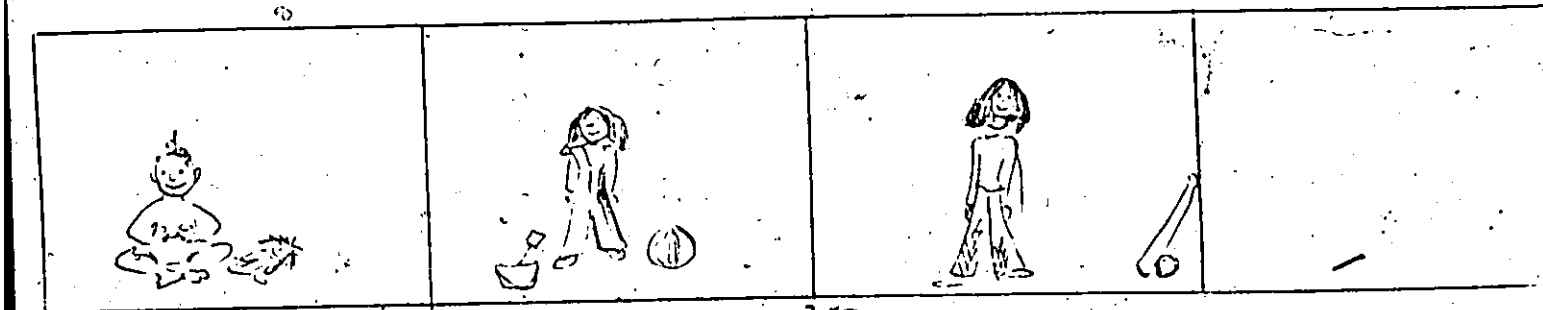
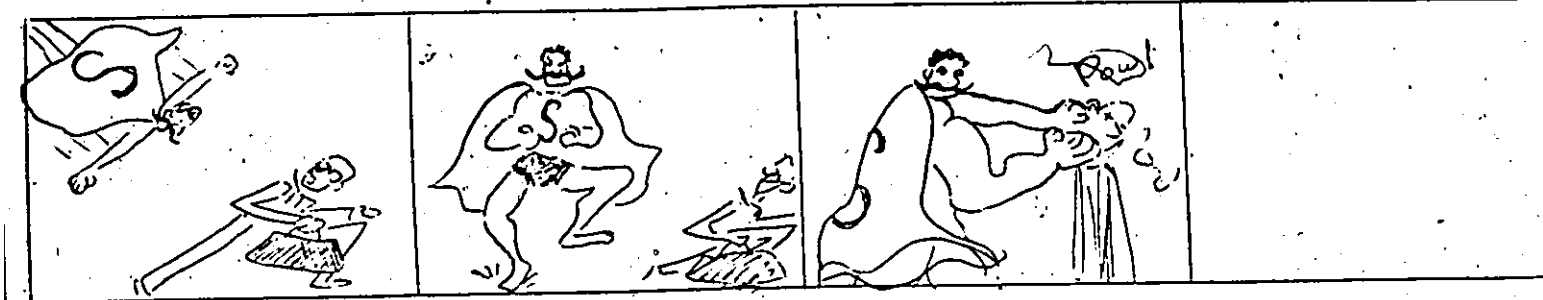
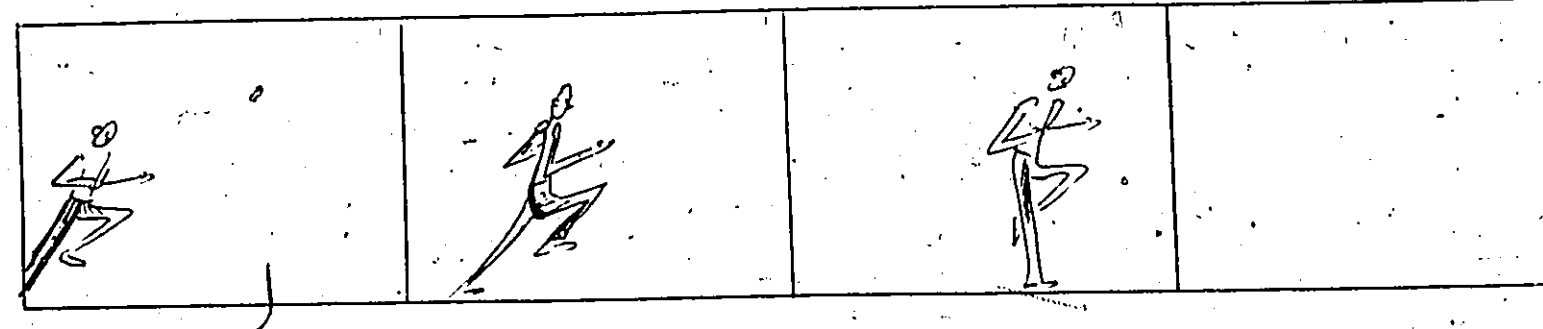
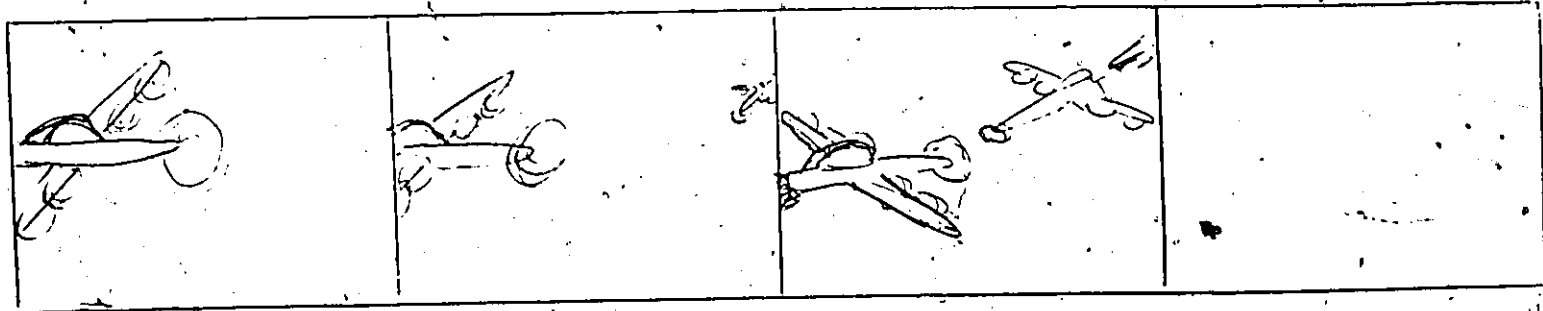
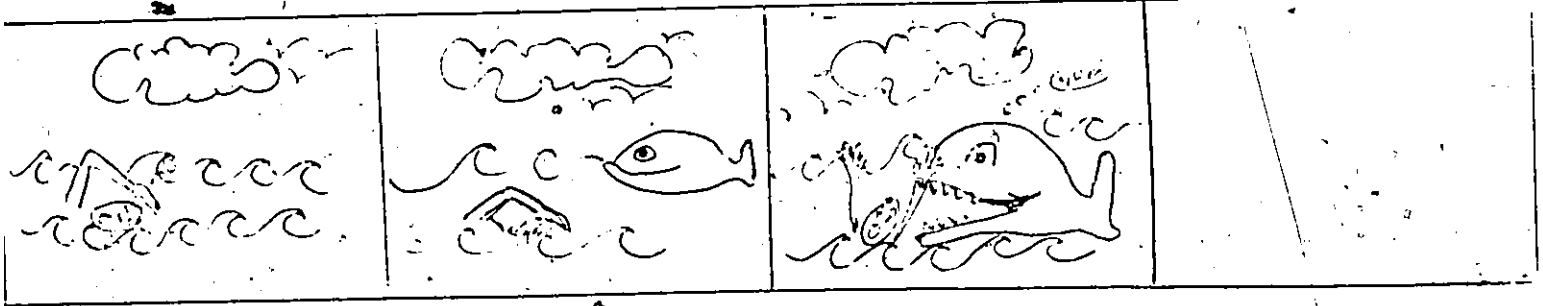
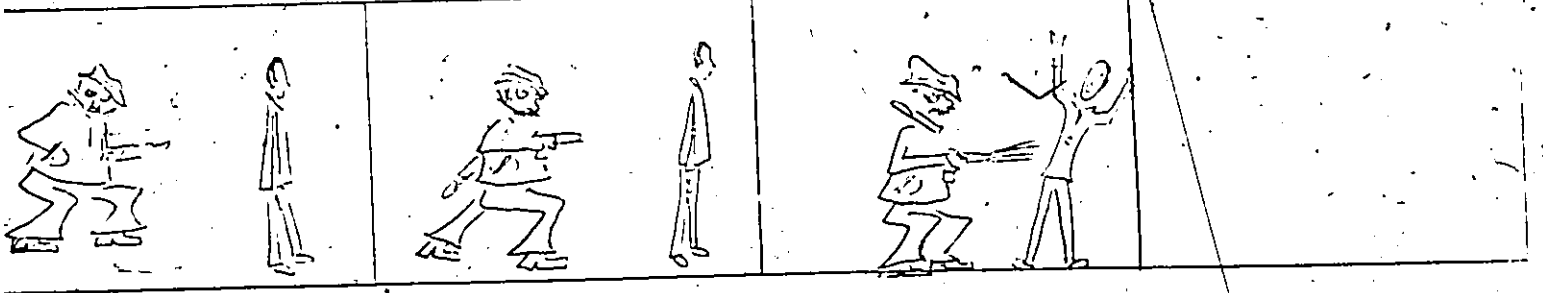
Loosely related to this is the theory of cause-effect, stimulus-response. You hit someone, they hit you back.

Your basic technique is to introduce the progressing ideas as briefly as possible and then elicit examples and comments. Make the work emanate from them and by the end, maybe even you'll know what a progression is.

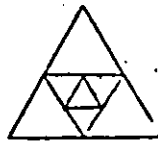
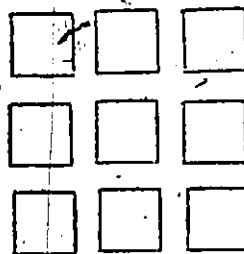
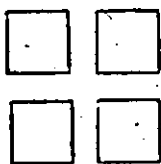
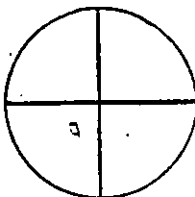
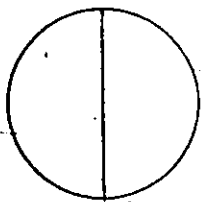
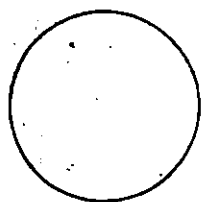
PROGRESSIONS
Inductive Thinking

VI 20

1. a, b, c, d, ____
2. 1, 3, 5, 7, ____
3.  ____
4. a, ab, abc, ____
5. az, by, cx, dw, ____
6. g, g, g, g, ____
7. |, |, ||, ||, ____
8. |, v, w, w, ____
9. n, , , ____
10. , , , ____
11. a, e, i, o, ____
12. 1, 5, 9, 13, ____
13. G, Ch, Cho, Ghos, ____
14. v, ^, v, ____
15. 10, 7, 4, ____
16. 5, 10, 15, 25, 30, 35 ____
17. Short, Shorter, Shortest, long, longer, ____
18.) ,)(,) , ____
19. North, South, East, ____
20. A EF H Where does I go?
BCD G
21. A, As, ask, adds, ____
22. a, to, fat, cool, those ____
23. 1, 4, 9, 16, 25 ____



PROGRESSIONS



DEDUCTION

Ask the following questions

1. James is tougher than Ernest. Ernest is stronger than John.

Can James beat John?

2. Yesterday was hotter than the day before. The day before and last Thursday were about the same.

Was yesterday hotter than last Thursday?

3. John won't mess with David, David can't beat up Larry but can beat Sam. Sam is about the same as Ernest. Ernest is a little stronger than Sam.

If Sam and John had a fight, who would win?

4. Tommy is twenty-three. His father is twice as old as he. He has an older brother who is six years older than he. Tommy's cousin is older than Tommy's brother.

What is the least age of Tommy's cousin?

5. If I'm older than you and you're older than him, but he's not older than that dude over there. Can you tell me if I'm older than that dude over there?

6. A is bigger than D. B is bigger than D.

Is A bigger than B?

7. If I'm the fastest one in this room, and this other kid comes into the room and he says, "I can beat anyone here," and you race him and you tie him. Is he faster than me?

8. $A > D$, $C > D$, $F > G$, $G = D$, $A = C$

$ZsA > F$?

DEDUCTION -

1. Someone opened the door and the man died. How did he die?

(The door was a hangman's trapdoor and the man died from being hung)

2. The man was dead and next to him was a small pool of water. How did he die?

(He stabbed himself with an icicle)

3. The man was found with a pack on his back, face down in the middle of the desert. How did he die?

(He was a skydiver and his chute didn't open)

4. The car was locked, all the windows closed, yet my friend got inside it without breaking anything. How did he do it?

(It was a convertible with it's top down)

5. There was a terrible car crash. In one car, a father and his son were messed up pretty bad. The father died on the way to the hospital. The doctor came in to the operating room, saw the boy lying there and said, "Don't operate, this boy is my son." How could this be?

(The doctor was the boy's mother)

6. Two fathers and three sons went fishing. They caught twenty-one fish yet, each person caught an equal amount of fish. How could this be?

(There were only three people--a grandfather, a father and a son--the father is both a father and son)

MYSTERY I

When he was discovered dead, Mr. Kelley had a bullet hole in his thigh and a knife wound in his back.

Mr. Jones shot at an intruder in his apartment building at 12:00 midnight.

The elevator operator reported to police that he saw Mr. Kelley at 12:15 a.m.

The bullet taken from Mr. Kelley's thigh matched the gun owned by Mr. Jones.

Only one bullet had been fired from Mr. Jones' gun.

When the elevator man saw Mr. Kelley, Mr. Kelley was bleeding slightly, but he did not seem too badly hurt.

A knife found in Miss Smith's yard had Mr. Scott's fingerprints on it.

Mr. Kelley had destroyed Mr. Jones' business by stealing all his customers.

The elevator man saw Mr. Kelley's wife go to Mr. Scott's apartment at 11:30 p.m.

The elevator operator said that Mr. Kelley's wife frequently left the building with Mr. Scott.

Mr. Kelley's body was found in the park.

Mr. Kelley had been dead for one hour when his body was found, according to the medical expert working with the police.

The elevator man saw Mr. Kelley go to Mr. Scott's room at 12:15 a.m.

The elevator man went off duty at 12:30 a.m.

It was obvious from the condition of Mr. Kelley's body that it had been dragged a long distance.

Miss Smith saw Mr. Kelley go to Mr. Jones' apartment building at 11:55 p.m.

Mr. Kelley's wife disappeared after the murder.

Police were unable to locate Mr. Scott after the murder.

When police tried to locate Mr. Jones after the murder, they discovered that he had disappeared.

The elevator man said that Miss Smith was in the lobby of the apartment building when he went off duty.

Miss Smith often followed Mr. Kelley.

Mr. Jones had told Mr. Kelley that he was going to kill him.

Miss Smith said that nobody left the apartment building between 12:25 a.m. and 12:45 a.m.

Mr. Kelley's blood stains were found in Mr. Scott's car.

Mr. Kelley's blood stains were found on the carpet in the hall outside Mr. Jones' apartment.

SOLUTION: After receiving a superficial gunshot wound from Mr. Jones, Mr. Kelley went to Mr. Scott's apartment where he was killed by Mr. Scott with a knife at 12:30 a.m. because Mr. Scott was in love with Mr. Kelley's wife.

MYSTERY II

The First National Bank of Minnetonka, Minnesota was robbed of \$1,000,000. Discover who did it.

The robbery was discovered at 8:00 a.m. on Friday, November 12. The bank had closed at 5:00 p.m. the previous day.

Miss Margaret Ellington, a teller at the bank, discovered the robbery.

The vault of the bank had been blasted open by dynamite.

The president of the bank, Mr. Albert Greenbags, left before the robbery was discovered. He was arrested by authorities at the Mexico City airport at noon on Friday, November 12.

The president of the bank had been having trouble with his wife, who spent all of his money. He had frequently talked of leaving her.

The front door of the bank had been opened with a key.

The only keys to the bank were held by the janitor and the president of the bank.

Miss Ellington often borrowed the president's key to open the bank early when she had an extra amount of work to do.

A strange, hippie-type person had been hanging around the bank on Thursday, November 11, watching employees and customers.

A substantial amount of dynamite had been stolen from the Acme Construction Company on Wednesday, November 10.

An Acme employee, Howard Ellington, said that a hippie had been hanging around the construction company on Wednesday afternoon.

The hippie-type character, whose name was Dirsey Flowers, and who had recently dropped out of Southwest Arkansas State Teacher's College, was found by police in East Birdwatch, about ten miles from Minnetonka.

Dirsey Flowers was carrying \$500 when police apprehended him and had thrown a package into the river as the police approached.

Anastasia Wallflower of East Birdwatch, Wisconsin, said she had bought \$500 worth of genuine Indian love beads from Dirsey Flowers for resale in her boutique in downtown East Birdwatch.

Anastasia said that Dirsey had spent the night of November 11th at the home of her parents and left after a pleasant breakfast on the morning of the 12th.

When the police tried to locate the janitor of the bank, Elwood Smith, he had apparently disappeared.

Miss Ellington stated that her brother Howard, when strolling to Taylor's Diner for coffee about 11:00 p.m. on Thursday, November 11, had seen Mr. Smith running from the bank.

Mr. Smith was found by the F.B.I. in Dogwald, Georgia on November 12. He had arrived there via Southern Airlines Flight 414 at 5:00 p.m. on the 11th.

The airline clerk confirmed the time of Smith's arrival.

Mr. Greenbags was the only person who had a key to the vault.

There were no planes out of Dogwald between 4:00 p.m. and 7:00 a.m.

In addition to keeping payroll records, Mr. Ellington was in charge of the dynamite supplies of the Acme Construction Company.

Mr. Greenbags half-brother, Arthur Nodough, had always been jealous of his brother.

Nodough appeared in Chicago on Monday, November 8, waving a lot of money.

Arthur wanted to marry Camelia Smith.

Miss Ellington said Smith had often flirted with her.

Miss Smith's father, a gold prospector in Alaska, had died in September.

Mr. Greenbags waited in the terminal at O'Hare Field in Chicago for 16 hours because of engine trouble on the plane he was to take to Mexico City.

SOLUTION: The Ellingtons collaborated to rob the bank, Miss Ellington supplying the front door key (borrowed from Mr. Greenbags) and Howard supplying the dynamite. Greenbags had already left for Brazil when the robbery took place. Mr. Smith was in Dogwald on the night of the robbery. Dirsey Flowers was at the home of Anastasia's parents. The Ellingtons were lying when they tried to implicate Smith. There was no evidence that Arthur Nodough was connected with the robbery in any way.

MYSTERY-II

Below will be given a situation and several clues. Cut the clues out separately and distribute them evenly among all the people in your group. Only by each member sharing his clues can the murder be solved

Situation: A dope house on Seven Mile and Wyoming was investigated because of neighbors complaints. Police when entering found two men lying dead, who killed them and why?

One of the men was Ernest Wagner, a Loan Shark.

The police autopsy indicated that both men were killed at 1:00 a.m.

Ernest Wagner died of fatal gun shot wounds..)

Jonas Stallworth died of an overdose of heroin.

Police got a tip that a known junkie Lorenzo Hardy was seen running from the house at 11:00 that night.

The person who phoned in the tip refused to give his name but had a heavy Mexican accent.

Louis Wriston had taken a large loan out from Ernest Wagner two months before the killings.

Thomas Westington, an ex-con, was also in debt to Wagner. Three eye-witnesses had heard Westington threaten to kill Wagner. Westington had spent five years in Jackson State prison for armed robbery and assault with intent to kill.

An owner of a pawn shop on Woodward identified Wriston's picture as the man who had bought the hand gun two weeks before the murder.

The police found Lorenzo Hardy on dope the morning of the killings, in his coat was the gun that had killed Ernest Wagner. Police matched the gun they found on Hardy and determined it was the same gun that Wriston had bought from the pawn shop.

According to most of the people who knew him. Stallworth strictly dealt and was not a junkie.

Another junkie, Thomas Gomez, was a long time customer of Stallworth. Three witnesses saw Gomez at the house the night of the murders. Wriston's wife had seen Gomez over the house a few times, and on one occasion, Wriston had given Gomez a lot of money.

Gomez was found the night after the killing with a thousand dollars worth of heroin on him.

The gun that police seized from Hardy had Gomez's fingerprints on it.

Neighbors told the police that Wriston was home with his wife the night of the killings.

DEDUCTION - 3A

Logic Problem

In a certain bank, the positions of cashier, manager, and teller are held by Brown, Smith and Jones, though not necessarily in that order.

The teller, who was an only child, earns the least. Smith, who married Brown's sister, earns more than the manager. What position does each man fill?

	Teller	Manager	Cashier
Brown			
Smith			
Jones			

1. Teller was an only child
2. Brown has a sister
3. Smith earns more than the manager.
4. The teller earns the least.

Deduction - 3A - Continued (Logic Problem)

Clark, Daw and Fuller make their living as a carpenter, painter and plumber, though not necessarily in that order.

The painter recently tried to get the carpenter to do some work for him, but was told that the carpenter was out doing some remodeling for the plumber.

The plumber makes more money than the painter.

Daw makes more money than Clark.

Fuller has never heard of Daw.

	Painter	Carpenter	Plumber
Clark			
Daw			
Fuller			

LOGIC IN LIFE

Mr. Carter, Mr. Flynn, Mr. Milne, and Mr. Savage serve the little town of Milford as architect, banker, druggist, and grocer. Though not necessarily in that order. Each man's income is a whole number of dollars.

The druggist earns exactly twice as much as the grocer, the architect earns exactly twice as much as the druggist, the banker earns exactly twice as much as the architect.

Although Mr. Carter does not make more money than Mr. Flynn, Mr. Flynn does not make twice as much as Mr. Carter.

Mr. Savage earns exactly \$3760 more than Mr. Milne.

	Banker	Druggist	Architect	Grocer
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Carter				
Flynn				
Milne				
Savage				

DEDUCTION - 1B

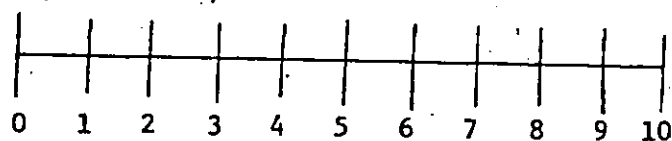
GUESS-A-CARD

Materials needed: A deck of cards

Pick a card out of the deck and ask the children to ask yes and no questions about what card it is. Do this three or four times, sometimes letting the kids do it. Have them figure out the least number of questions that can be asked to figure out a card.

Deduction

Guess-a-Number



Say: "I'm thinking of a number from 1 to 10. Guess the number."

"How many guesses did it take?"

"Can we try it a way that will eliminate all these questions?"

"What is the least amount of questions you can ask to find the number?"

"Does this work all the time?"

"How about if we guess a number from 1 to 20?"

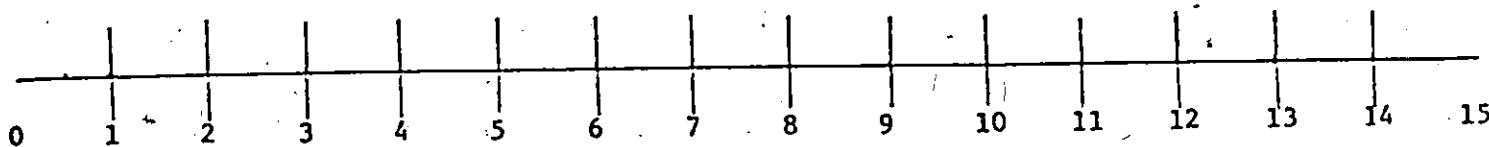
"What is the least number of questions you can ask?"

"Does it make a difference if the questions you ask are answered 'Yes' or 'No'?"

"What about 1 to 50, 1 to 100 or 1 to 1,000?"

GRAPHING

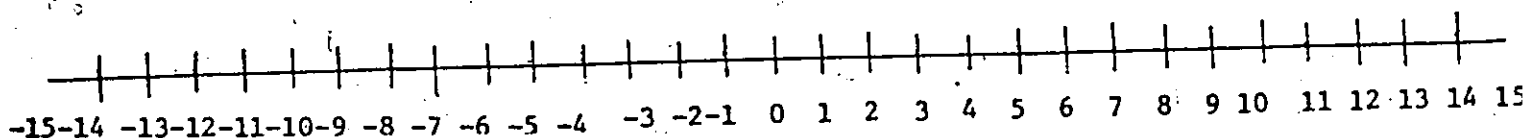
Draw a line on the board



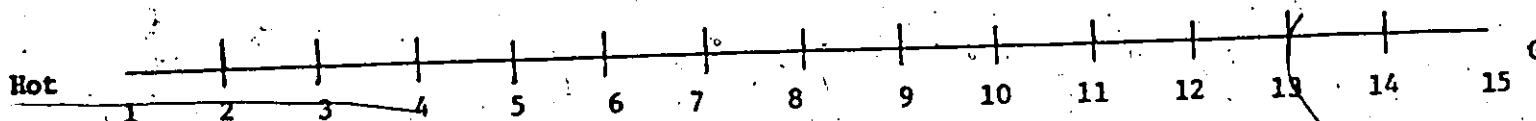
Find: $5\frac{1}{2}$ $2\frac{1}{2} + 3$

$7 + 2$ $9 + 2$

$6 - 4$



Find: -5	$2-3$	$3-15$
$+7$	$2-8$	$3-12$
-8	$-5+8$	$-2-6$
$-1\frac{1}{2}$	$-1 + -1$	$-4-7$
$+6$	$-3-9$	

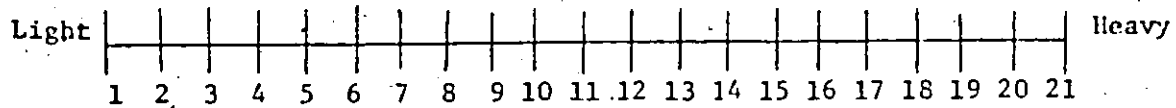


Rate the following objects to the degree in which they are hot or cold.

1. ice cream
2. candle
3. ice cube
4. chair
5. coca-cola

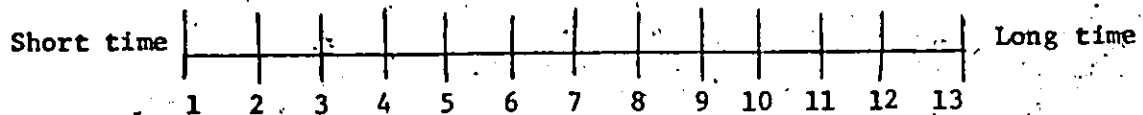
6. heater
7. forest fire
8. 32°
9. 105°
10. 65°

11. 120°



Put the following colors in order of lightness to darkness:

1. The color of the sky.
2. White.
3. The color of grass.
4. Pink.
5. Black.
6. Purple.
7. The color of the sun.
8. The color of milk.
9. The color of ashes.
10. The color of white people.
11. The color of smoke.
- 12.. Tutor and students to name and rank others.



Rank the following timespans:

1. The time it takes to eat dinner.
2. Three minutes.
3. The time it takes for your heart to beat 60 times.
4. Four days.
5. The time it takes to mail a letter from Detroit to New York.

Continued....

GRAPHING Continued...

6. The time it takes to drive 10 miles at 60 m/p/h.
7. Ten seconds.
8. The longest time you can go without air before you die.
9. The average time it takes you to fall asleep at night.

GRAPHING AND MAPS

VIII 2.

Graphing two Dimensions

Ask, "Who is the tallest in the class, who is the second tallest in the class, who is the third, etc."

Suppose I wanted to write on the board this information, how would I do it?

How could I write in the shortest possible way who was the tallest, second tallest, third tallest, etc.?

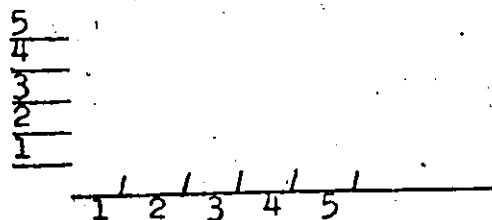
How about if we draw a graph

smallest _____ tallest

Where does each name go? Is there another way we can do this?

Everyone or you take a number (if there are four, number them 1-4). Okay, let me draw something new.

person

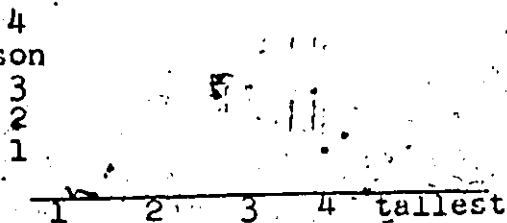


Tallest

Who is number one? What order of tallest are you in relation to the others?

Example: Say he was the fourth tallest, you would place a dot at number one and four (see graph)

person



Graphing and Maps - - Continued:

Have the rest of the class fill in their places at the graph.

Do a similar graph this time, using age as what you want measured.

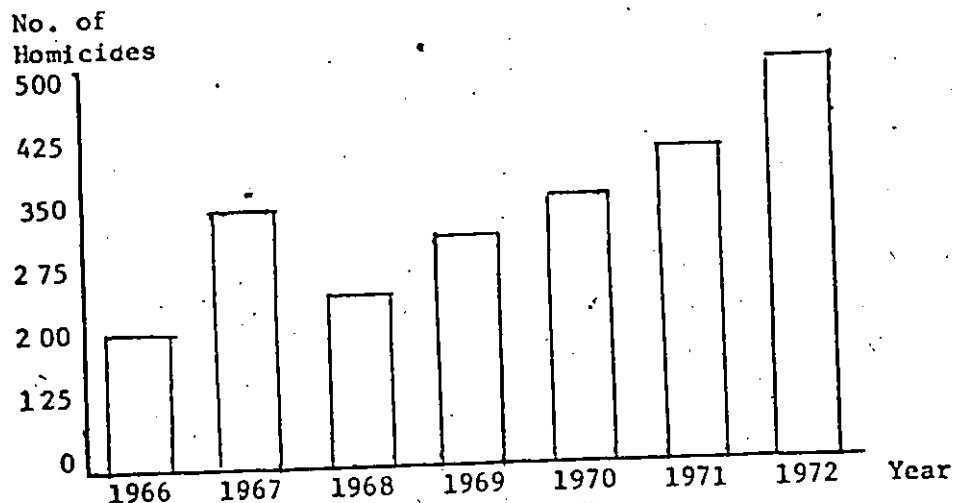
Who is the oldest? second oldest? Third oldest? This time, have the students do as much of the graph planning as possible. Keep asking questions like--"What do I do next?" "What did I do on the other graph?"

1. Switch it around now, doing who is the youngest in the class, same kind of graph.
2. Next, have each student make their own individual graphs, using who has the biggest family.

DISCUSSION

1. What's the difference between this way of graphing and the first way with just a line?
2. Which is easier to follow?
3. Which records more information.
4. What's the use of doing this kind of thing anyway?

GRAPHING 3A



1. How many people were murdered in 1960?
2. How many were murdered in 1971?
3. Which year were the most people murdered?
4. Which year were the least number of people murdered?
5. Has the murder rate gone up or down from 1960 to 1970?
6. In which year were there 200 murders?
7. Which year had 75 more murders than the year before?
8. What kind of factors could make the murder rate go up?

1

1

m

■

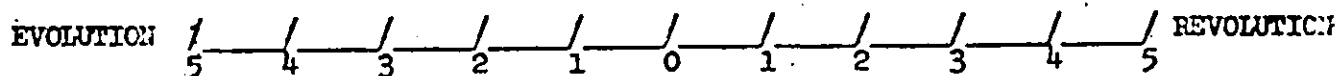
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Teaching Unit #5
 Evolution and Revolution
 Page 2

teacher can easily develop discussion and stimulation through use of the
 EVOLUTION/REVOLUTION linear scale:



Give examples of current matters such as ECOLOGY, BLACK PANTHERS, BUSING, WELFARE,
 Etc. and allow each student to relate it to the scale, and discuss the ratings.

My subjective ratings are:

ECOLOGY: (as a process) Evolution 3
 (as a cause) Revolution 3

BLACK PANTHERS: Revolution 4

BUSING: Is it really revolution or evolution - case for each?

WELFARE: Same as busing.

AL:sw
 Winter, 1972

SATURDAY TUTORING PROGRAM

Teaching Unit #6

Freedom - Relativity

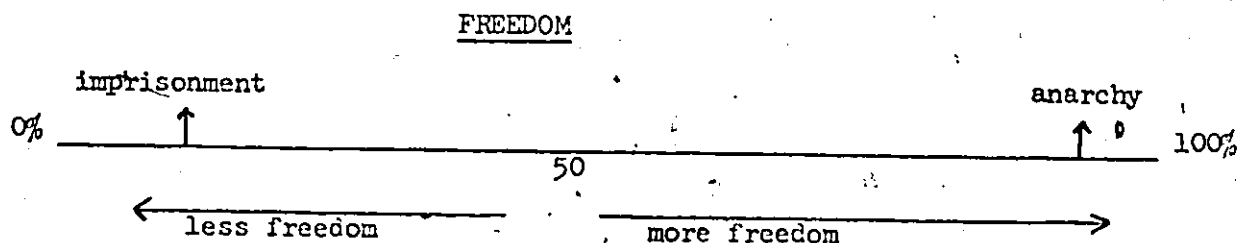
Materials Needed: Blackboard, linear scales (xeroxed)

Maximum Time: 15 Minutes

Purpose of Lesson: To illustrate the relativity of the concept "Freedom."

Introduction (5 Minutes)

Explain the linear concept, from most inclusive to least inclusive (use dictionary definitions also).



The zero and 100 points are nearly indefinable. The closest that we may be able to come is anarchy, which is not total freedom (discuss), and imprisonment, which is not total lack of freedom (discuss).

The teacher should discuss other concepts to show that they may fall somewhere between zero and 100 on the scale.

Exercises #1-5 (Approximately 2 minutes each)EXAMPLES

Busing
Welfare
War (Vietnam)
School
Police
Drug Laws
Voting

For each exercise, using one of the concepts at the left (or similar concepts) have the students rate it on the scale by marking and numbering. Discuss after each exercise, and show group how their answers relate to each other. As students become more facile in working with the scale, the answers of the group should begin to bear some similarity in the later exercises. (Note: as relativity is a "subjective" concept, this is not a goal of the lesson.) (Give one token after completion of each exercise.)

Winter, 1972
AL:sw

Words that are cool

















1. This word is cool mark.
2. Is this word cool miles.
3. No. 2 is not a cool word.

Is dark a cool word?

4. Dark is a cool word, is darker a cool word?
5. Darker is not a cool word, is star a cool word?
6. Star is not a cool word, is hard a cool word?
7. Hard is a cool word, is hate a cool word?
8. Hate is a cool word, is hated a cool word?
9. Hated is not a cool word, is mars a cool word?
10. Mars is a cool word, is parrot a cool word?
11. Parrot is not a cool word, is pray a cool word?
12. Pray is not a cool word, is many a cool word?
13. Many is a cool word, is dope a cool word?
14. Dope is not a cool word, is bear a cool word?
15. Bear is not a cool word, is rape a cool word?
16. Rape is a cool word, is sang a cool word?
17. Sang is a cool word, is song a cool word?
18. Song is not a cool word, is part a cool word?
19. Part is a cool word, is pat a cool word?
20. Pat is not a cool word, is land a cool word?
21. Land is a cool word.
22. What is a cool word?

CONTROLLING VARIABLES 2A

What is a Glop?









1.  is a glop, is  a glop?
2.  is not a glop, is  a glop?
3.  is not a glop, is  a glop?
4.  is not a glop, is  a glop?
5.  is a glop, is  a glop?
6. No. 5 is a glop, is  a glop?
7. No. 6 is a glop; is  a glop?
8. No. 7 is not a glop, is  a glop?
9. No. 8 is a glop, is  a glop?
10. No. 9 is a glop, is  a glop?
11. No. 10 is not a glop, is  a glop?
12. No. 11 is not a glop. What is a glop?

COLLECTIVE PROBLEM SOLVING

1. House is allowed but home isn't.
2. South is allowed, but sanz isn't.
3. Mouths are allowed, but smell isn't
4. Shin is allowed, but hang isn't
5. Soap is allowed, but deterrent isn't
6. Ones are allowed, but han isn't.
7. Ounces are allowed, but pounds isn't
8. Soup is allowed, but sandwich isn't
9. Smoke is allowed, but take isn't,
10. What is allowed?

COMPLEX PROBLEM SOLVING

What is a Yang?

1.  is a yang.
2. Is  a yang?
3. No. 2 is not a yang, is  a yang?
4. No. 3 is a yang, is  a yang?
5. No. 4 is not a yang, is  a yang?
6. No. 5 is a yang, is  a yang?
7. No. 6 is a yang, is  a yang?
8. No. 7 is not a yang, is  a yang?
9. No. 8 is a yang. What is a yang?

What is a Ying?

1. Dog is a Ying. Is television a Ying?
2. Television is not a Ying. Is chair a Ying?
3. A chair is not a Ying. Is a cat a Ying?
4. A cat is a Ying. Is a plane a Ying?
5. A plane is not a Ying. Is a tree a Ying?
6. A tree is a Ying. Is a mountain a Ying?
7. A mountain is a Ying. Is a house a Ying?
8. A house is not a Ying. Is a lake a Ying?
9. A lake is a Ying. Is your mother a Ying?
10. Your mother is a Ying. Is a candy bar a Ying?
11. A candy bar is not a Ying. Is grass a Ying?
12. Grass is a Ying. Is cigarettes a Ying?
13. Cigarettes are not a Ying. Is tobacco a Ying?
14. Tobacco is a Ying. Is a deck of cards a Ying?
15. No, a deck of cards is not a Ying.
16. What is a Ying?

COMPLEX PROBLEM SOLVING GAME ANALYSIS

The concept of game analysis may seem vague in view of other more specific concepts such as symbolism or progression. Yet, this skill (if it can be defined as a single skill) is perhaps the most sophisticated one that can be taught.

Game analysis may be explained this way: When two people consort to play a game with each other, both of their immediate environments are altered. They encounter each other in a new environment with different rules and assumptions. The ability of a player to process and analyze a game's factors will serve as a prediction of who is to win the game. Thus, analyzing a game teaches one to evaluate possible choices and chooses the most beneficial. It encourages one to think before acting.

We teach game analysis by presenting a game in its most simple form. Without many interfering stimuli, the student can pick out the relevant variables that determine winning and losing acts. It must be stressed that a student is never to be told how to win, he must discover that himself. Sometimes, it becomes necessary for the tutor to ask leading questions, i.e., questions that focus on student's attention to the more relevant variables. But the student is never asked to memorize the "trick of the game."

GAME ANALYSIS

IX 13

Tic - Tac - Toe

Draw a Tic - Tac - Toe game on the board. Ask:

"How do you play this game?"

"Everyone turn to the person next to you and play this game twice. First one of you than the other."

"Who won the game?"

"Did it make a difference who went first?"

"Look at the move before the last one - if you were to take that move over, would the game turn out different?"

"If not, why?"

"Can you go back to a move that would change the game?"

"Let me play a game with you - I'll start."

x	o	o
	o	
x		x

"How did I win? Let's play again."

"When did you know that I had won the game?"

"What moves were you forced to make?"

"How often do you win after you're forced to make a move? How do you force moves in this game?" Try it with a 4x4 tic - tac - toe.

Draw a game of Dots on the board 4x4. Explain how to play this game.

.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

"How do you win this game?"

"Play it with the person next to you."

"What were the winning moves?"

"What moves were forced?"

"Does it matter who goes first?"

"Play this with me."

"How do you force moves in this game?"

1. 1.

COMPLEX PROBLEM SOLVING

Game analysis

Monopoly

Object: To determine the factors that influence winning in the game of Monopoly.

Task: Discussion after the game was played.

1. What are the best properties to buy? What are the chances that someone will land on these? What makes a property good? What are the differences between the railroads, utilities, and the conventional properties?
2. How important is it to get a Monopoly? How much above the worth of a needed property were you willing to pay in order to get that property to complete a Monopoly?
3. What are the factors of luck in the game? What are the factors of skill?

GAME ANALYSTS

Prisoners Dilemma

The class is divided into two teams. On the board, draw the following figure:

		Team B	
		I like you	I don't like you
Team A	I like you	+5 +5	+10 -10
	I don't like you	-10 +10	-5 -5

Tell the class the object of this game is to get as many points as possible. Let me emphasize this. You are not competing with each other. Both teams are to get as many points as possible. Each team has two possible choices. He can say, I like you or I don't like you. It is the combination of both teams choices that determines who scores what.

For example: If team A says, "I like you and Team B says, "I don't like you, then Team B scores +10 and Team A scores minus 10.

This chart should help you

<u>Team A</u>	<u>Team B</u>	<u>Team A score</u>	<u>Team B score</u>
I like you	I like you	+5	+5
I don't like you	I don't like you	-5	-5
I don't like you	I like you	+10	-10
I like you	I don't like you	-10	+10

The game consists of nine rounds. Have each team write out their choice on a slip of paper. The choices must be kept silent. You, as the teacher, compute the score for each round and write it on a score card on the blackboard.

	Team A	Team B
Round 1		
2		
3		
4		
5		
6		
7		
8		
9		

Don't say which team did which move, just write on the score card who scored what. The kids should pick that up. After the sixth round, say "For the next three rounds, the scores will be doubled." Erase the first graph and draw the second graph.

		Team B	
		I like you	I hate you
Team A	I like you	+10 +10	+20 -20
	I hate you	-20 +20	-10 -10

Before we start the next three rounds, each of the teams send one person out to bargain the scores.

After the two people have negotiated, proceed with the next three rounds as before.

Discussion

Ask the following questions:

What did I say the object of the game was?

Did both teams get as many points as possible? Why not?

How did you feel when one team gave you an "I don't like you answer?"

What does trust mean?

Do you trust the persons on the other teams less?

When should you trust people?

Whom should you trust?

Can you get by in life without trusting?

How much should you trust some one?

Note:

Another skill that can be taught in this lesson is the skill at reading a four-celled graph. Make sure each team person becomes proficient in that.

GAME ACTIVITIES -

"Mathmagic Dice" Game.

Number of players: Works in groups of two players. One player rolls the dice, and the other player reads the directions to the dice roller.

Materials needed: three dice per two players; game direction card per two players.

How to play: Both players sit with backs to each other. One of the players reads the following directions to the other player who is the dice roller.

"Roll your dice on the table. Add the top surfaces of your three dice.

Pick up one die and add its opposing side to the previous total. Roll this die. Now add its top surface to the answer you have. Leave your three dice on the table for me to look at them. I'll tell you the answer you got."

(Note to the direction giver:) Add the top surface of the three dice and add seven more to get the final total. If your partner can't determine how you got the answer, play again.)

Why does this work?

NATURAL AND NUMERIC LAWS
Conservation with Water

Materials needed: Two cups the same size; assorted
cups in different sizes.

Place the two cups together. Ask the child to fill them with water so that each cup contains the same amount of water. When everyone agrees that they are the same, then pour one of the cups into a larger cup. Then ask which cup has more water. Ask them to prove their answers. Pour the water from the large cup into three or four separate cups. Ask if the water from the separate cups together is the same as the water in the large cups. Ask them to prove their answers.

Piagetian Tasks

1. To be done with clay: Have the class roll two balls of clay so they are the same size. Ask the class "are both these balls the same amount of clay." If they agree, then take one of the balls and roll it into a snake, then ask if both of these still have the same amount of clay. If again the answer is yes or no, ask them to prove their answer.

Next, split the snake into smaller particles and ask the class if there is still the same amount in each group, i.e., "Is the smaller particle put together the same amount as the larger one?"

How do you know for sure?

Why might someone think that they were not the same size?

Do these things look as if they were the same size?

NATURAL AND NUMERIC LAWS - 1B

Addition as the converse of subtraction

1. How does addition relate to subtraction? How were you taught to check on addition problems? How were you taught to check a subtraction problem? Suppose you start out with '0' then add '5' then subtract '5' - what do you have left? How did the subtraction of '5' counteract what the addition of '5' did?
2. Different mediums in which to show addition as the converse of subtraction.

1. Liquids

2. Pages of a book (add pages by clipping more together - subtract pages by separating them)

3. Cusenaire rods

4. Math problems

5. Words in a paragraph

6. Play money

NATURAL AND NUMERIC LAWS - 2B

What is addition? What is subtraction?

1. Direct the class in the following tasks

- a. Add a pencil to the table
- b. subtract three feet from the floor
- c. Add a pencil to the floor, and at the same time subtract one from the table
- d. Subtract a person from this room
- e. Add a person over by the wall

2. Discover what addition and subtraction are in the following tasks.

- a. Liquids
- b. Page of a book
- c. Cusenaire rods
- d. Math problems
- e. Words in a paragraph
- f. Play money

3. Should be done concurrently with natural and - numeric laws 1A.

Bread Mold

Materials needed: Plastic bags, bread slices

Ask the children "How many of you have seen bread mold? What does it look like? Where does it come from? When does it grow the most?"

I'll tell you what. let's use this bread and bags to see under what conditions will the bread mold grow the most. What things are going to affect how much mold grows on the bread? What would make the mold grow more? What makes plants grow more? Will the same thing that makes plants grow more make the bread mold grow? Which things will? How do we test out each of the factors that affect it? How can we prove that one thing makes the mold grow more than other things, or do you suppose a combination of things will make the bread mold grow? How can you arrange it so you'll cover all the possibilities?

Let's leave it for next week and see if we were right.

The Pendulum Problem

Materials needed: Strings of different lengths

Weights of different weights

The task is to find what forces or combinations of forces will make a pendulum swing faster over an average period of time. Have the student organize the testing trials so that every combination of force is tested. If students can't figure out the four forces, they are: 1. Length of string 2. Weight: 3. Length weight is trapped from 4. Force weight is trapped at.

presentation of the three dimension - "The Cube Problem"

EX. A

Bring in a cube at least 3" x 3" x 3". Say to the students, "draw a shape on a piece of paper, which, when folded will form a cube approximately the same size."

EX. B

Bring a cylinder the size of a beer can; in fact, bring in a beer can. A Pilsener beer can will suit. Say to the students "this is a beer can. Can you draw a shape on a piece of paper which when folded equals the size of this beer can?"

READING

The reading aspect of our concept curriculum although not yet fully developed, is presently divided up into two groups: 1) reading skills and 2) reading prose.

The skills are of a nature where an underlying concept is used to teach fundamentals of reading. For example, in the exercises entitled "What's the Difference," the concept of similarities is used to differentiate letters.

The reading prose are of a nature where there is a basic underlying theme in the story. The child is taught to find the theme and generalize it to other hypothetical situations.

11 1A

The student Hoken was to go on a long journey to another monastery. He was much upset, because he felt that this trip would interrupt his studies for many months. So he said to his friend the advanced student Sogen:

"Please ask permission to come with me on the trip. There are so many things I do not know; but if you come along we can discuss them - in this way I can learn as we travel."

"All right," said Sogen. "But let me ask you a question: If you are hungry, what satisfaction to you if I eat rice? If your feet are lame, what comfort to you if I go on merrily? If your bladder is full, what relief to you if I piss?"

. . . .

Two monks, Tanzan and Ekido, were walking down a muddy street in the city. They came on a lovely young girl dressed in fine silks, who was afraid to cross because of all the mud.

"Come on, girl," said Tanzan. And he picked her up in his arms, and carried her across.

The two monks did not speak again till nightfall. Then, when they had returned to the monastery, Ekido couldn't keep quiet any longer.

"Monks shouldn't go near girls," he said - "certainly not beautiful ones like that one! Why did you do it?"

"My dear fellow," said Tanzan. "I put that girl down, way back in the city. It's you who are still carrying her!"

. . . .

The student Shichiri was reciting the sutras when a robber entered his room, put a knife to his back, and demanded his money. "Over there in the box", said Shichiri, going on with his recitation.

As the robber was leaving, Shichiri said, "Leave me some for my taxes; they are coming around tomorrow to collect." So the robber put back some of the money and started to leave.

"Don't you thank someone who makes you a gift?" asked Shichiri. So the robber thanked him, and went off.

A few days later the robber was caught; and among other confessions, he said he had robbed Shichiri. But Shichiri refused to testify against him. "I made him a gift of some money," he said. "And he thanked me for it. That was all."

The robber served a prison term. When he was freed, he went directly to Shichiri. "Will you be my teacher?" he said.

A student came before the master Bankei and asked to be helped in getting rid of his violent temper.

"Show me this temper," said Bankei. "It sounds very fascinating."

"I haven't got it right now, so I can't show it to you," said the student.

"Well then," said Bankei, "bring it to me when you have it."

"But I can't bring it just when I happen to have it," protested the student, "I'd surely lose it again before I got it to you."

"In such a case," said Bankei, "it seems to me that this temper is not part of your true nature. If it is not part of you, it must come into you from outside. I suggest that whenever it gets into you, you beat yourself with a stick until the temper can't stand it and runs away."

...

The master Nan-in had a visitor who came to inquire about Zen. But instead of listening, the visitor kept talking about his own ideas.

After a while, Nan-in served tea. He poured tea into his visitor's cup until it was full, then he kept on pouring.

Finally the visitor could not restrain himself. "Don't you see it's full?" he said. "You can't get any more in!"

"Just so," replied Nan-in, stopping at last. "And like this cup, you are filled with your own ideas. How can you expect me to give you Zen unless you offer me an empty cup?"

...

11

Buddha told this parable: A traveler, fleeing a tiger who was chasing him, ran till he came to the edge of a cliff. There he caught hold of a thick vine, and swung himself over the edge.

Above him the tiger snarled. Below him he heard another snarl, and behold, there was another tiger, peering up at him. The vine suspended him midway between two tigers.

Two mice, a white mouse and a black mouse, began to gnaw at the vine. He could see they were quickly eating it through. Then in front of him on the cliffside he saw a luscious bunch of grapes. Holding onto the vine with one hand, he reached and picked a grape with the other.

How delicious!

...

While Bankei was preaching quietly to his followers, his talk was interrupted by a Shinshu priest who believed in miracles, and thought salvation came from repeating holy words.

Bankei was unable to go on with his talk, and asked the priest what he wanted to say.

"The founder of my religion," boasted the priest, "stood on one shore of a river with a writing brush in his hand. His disciple stood on the other shore holding a sheet of paper. And the founder wrote the holy name of Amida onto the paper across the river through the air. Can you do anything so miraculous?"

"No", said Bankei, "I can do only little miracles. Like: when I am hungry I eat, when I am thirsty I drink, when I am insulted, I forgive."

...

The Master Ryokan lived in a poor little hut on a mountainside. One moonlight night he came home and found a burglar looking for something to steal. But Ryokan was a hermit who owned nothing.

"Poor fellow," he said to the robber. "You have come a long way and have found nothing. But I don't want you to leave me empty-handed. Please take my clothes." And Ryokan stripped, and handed the clothes to the robber.

"Poor fellow," said naked Ryokan, going out-doors again when the inconsiderate robber had left, "How I wish I could have given him this wonderful moon."

...

There were two Zen temples in the town of Kyoto, and each had a bright young student who was sent on errands. The North temple sent its boy every day to buy vegetables. On his way he was met by the boy of the South temple.

"Where are you going?" asked the South temple boy.

"Wherever my feet will carry me." replied the other.

This answer silenced the South temple boy, and he went back and told the story to his teacher. Not to be outdone by the rival pupil, the teacher suggested: "When you meet that boy tomorrow, ask him the same question. He will give you the same answer, and then you say: 'Suppose you had no feet - then where would you be going?' That will fix him!"

The next day the two boys met. The boy from the South temple said: "Where are you going?"

"Wherever the wind will blow me," replied the other.

This again silenced the boy from the South temple, so he went back to consult his teacher. "I tell you what," said the teacher, "tomorrow you ask him: 'suppose there is no wind?'"

The next day the two boys met again. The boy from the South temple said: "Where are you going?"

The other answered, "To buy vegetables."

...

Matajura wanted to become a great swordsman, but his father said he wasn't quick enough and could never learn. So Matajura went to the famous dueller Banzo, and asked to become his pupil. "How long will it take me to become a master?" he asked. "Suppose I became your servant, to be with you every minute; how long?"

"Ten years," said Banzo.

"My father is getting old. Before ten years have passed I will have to return home to take care of him. Suppose I work twice as hard; how long will it take me?"

"Thirty years," said Banzo.

"How is that?" asked Matajura. "First you say ten years. Then when I offer to work twice as hard, you say it will take three times as long. Let me make myself clear: I will work unceasingly: no hardship will be too much. How long will it take?"

"Seventy years," said Banzo. "A pupil in such a hurry learns slowly."

Matajura understood. Without asking for any promises in terms of time, he became Banzo's servant. He cleaned, he cooked, he washed, he gardened. He was ordered never to speak of fencing or to touch a sword. He was very sad at this; but he had given his promise to the master, and resolved to keep his word. Three years passed for Matajura as a servant.

One day while he was gardening, Banzo came up quietly behind him and gave him a terrible whack with a wooden sword. The next day in the kitchen the same blow fell again. Thereafter, day in, day out, from every corner and at any moment, he was attacked by Banzo's wooden sword. He learned to live on the balls of his feet, ready to dodge at any movement. He became a body with no desires, no thoughts - only eternal readiness and quickness.

Banzo smiled, and started lessons. Soon Matajura was the greatest swordsman in Japan.

...

In the exercises below, there will be two objects. In the blank space next to them, write down what makes one different from the other.

Example - d o - The first one has a line up and down

1. o o

2. y - x

3. p - n

4. w - w

5. o - o

6. t - t

7. i - i

8. ~~z - z~~

9. i - i

10. e - c

11. k - k

12. v - w

13. v - u

14. o - p

15. o - d

16. o - b

17. o - g

18. b - d

19. n - d

20. c - u

21. t - l

22. x - y

23. v - y

To each of the examples below, there will be two last letters. In the first example, both letters are the same, while in the other two, one letter is different from the other.

Example: m - n - - The "n" has one more downward half circle than the "m".

1. r - e
2. p - d
3. c - u
4. g - o
5. w - i
6. u - n
7. v - w
8. h - n
9. k - h
10. o - u
11. o - c
12. d - t
13. h - p
14. w - v
15. z - n
16. o - d
17. l - e
18. l - i
19. r - b
20. p - b
21. h - n
22. a - n
23. a - v

READING

Write a Story.

Collect some old fable, adages, cliches, etc. Have the child write a story depicting this adage in a new situation.

Appendix C

1. The Number Assigned to Each Court Ward, Referred to the Saturday Tutoring Program by Court or Clinic Staff and Initially Tested on September 25, 26, or 27, 1973; Their Sex, Race and Age at Initial Testing; Their Raw Scores on the Raven's Progressive Matrices, Random Placement in Conceptual (Numbers 1-10), Academic (Numbers 11-20) or Control (Numbers 21-30) Groups, and Explanation for Any Missing Data

Subj	Age		Sex	Race	Raven's		Missing Data	Explanation
	Yrs.	Mos.			Raw	Score		
1	11	6	F	B	13			
2	14	6	F	W	42			
3	12	9	M	B	14		Grades, Attendance, Citizenship for 1972-73 and 1973-74	Placed at W.J. Maxey School Northville State Hospital; Youth Home Incarceration.
4	13	10	M	W	35		All Follow-up Data Except Days of Youth Home Incarceration	Placed in Star Commencement Fall of 1974.
5	14	11	M	B	23			
6	12	10	M	B	27		Citizenship for 1972-73	School Lost Record
7	13	6	M	B	29		Citizenship for 1972-73 and 1973-74	Not Used in Special Educational Classes.
8	15	2	M	B	25		Follow-up Test Scores	Refused to be Retested.
9	15	4	M	B	21			
10	14	0	M	B	20		Grades, Attendance, Citizenship for 1972-73	Placed in Northville State Hospital
11	16	2	F	W	30		Grades, Attendance, Citizenship for 1972-73 and 1973-74	Placed at Barst House; attended Vista Maria
12	10	11	F	B	12		Follow-up Test Scores	Uncooperative Guardian
13	13	11	F	B	20		Grades, Citizenship for 1972-73 Time Spent on Initial Raven's; Follow-up Test Scores	School Lost Record; Tester Forgot to Record Refused to be Retested
14	11	5	M	B	22			
15	12	10	M	B	14		All Follow-up Data; Hours of Tutoring	Youth Home Incarceration and Escape
16	15	3	M	B	37			
17	14	1	M	B	9			

Appendix C1 (continued)

Subj.	Age Yrs. Mos.	Sex	Race	Raven's Raw Score	Missing Data	Explanation
18	13	3	M	B	17	School Refused to Grade Due to High Absenteeism; Refused to be Retested
19	15	0	M	B	29	Not a Registered Student
20	17	7	F	B	19	
21	15	9	M	W	36	Enrolled in GED Classes
22	16	1	M	B	26	
23	12	2	M	B	5	Citizenship Not Given; Address Unknown; Not Registered in Detroit Public Schools
24	16	0	F	B	25	
25	13	1	M	B	30	Youth Home Incarceration; Placed at Wayne County Child Development Center
26	15	0	F	W	45	School did not Rate Due to High Absenteeism
27	16	6	F	W	38	Placed at Barst House; attended Vista Maria; Youth Home Incarceration; Could not be Located for Retesting
28	10	3	F	B	14	Uncooperative Parent
29	11	1	F	B	16	
30	13	2	M	B	28	

Appendix C

2. Raw Data Summary Sheet for Tests Administered Before and After the 12 Week Experimental Period for All Ss

Subject	Lorge-Thorndike			Raven's			Digit Span			Word Meaning		Parag. Meaning		Arith. Meaning	
	Pre	Post	I.Q.	Pre	Post	Minutes	Pre	Post	Raw	Pre	Post	Pre	Post	Pre	Post
1	56	63	81	13	13	6.0	12	9	14	9	3.2	3.2	3.6	2.5	4.9
2	63	79	75*	42	45	13.5	11	9	10	8	6.4	4.8	5.0	6.7	7.5
3	15	20	50	14	5	15.0	8	10	7	10	1.7	1.0	1.5	2.3	2.6
4	76	82*	82*	35	22	12.5	10	10	10	5.1	4.8	4.8	4.1	4.1	2.6
5	39	40	65*	23	24	10.0	8	6	6	2	3.3	2.3	1.8	2.3	2.6
6	28	39	61	27	24	12.0	12	8	13	7	6.9	2.4	4.8	4.4	3.6
7	54	63	71	29	31	8.0	9	10	8	10	3.7	3.9	4.4	3.1	2.6
8	35	63*	63*	25	25	8.5	12	11	11	4.4	3.7	3.7	3.2	3.2	2.6
9	13	27	45**	21	20	12.5	8	9	6	7	1.9	1.9	1.9	2.8	3.0
10	21	23	53*	20	23	7.5	11	10	10	2.6	2.7	1.4	2.0	3.0	3.2
11	25	62	57*	30	27	5.75	6	9	2***	7***	6.9	6.0	5.5	5.6	4.2
12	16	61	61	12	12	11.0	7	7	6	1.8	2.7	2.7	2.6	2.6	2.7
13	38	64*	64*	20	21	a	9	8	8	3.1	3.7	3.7	1.9	2.7	2.7
14	25	24	66	22	22	23.0	11	9	12	1.6	2.5	1.7	1.9	1.6	4.2
15	15	15	49**	14	14	15.0	8	7	7	1.7	3.3	1.0	3.4	5.1	2.4
16	39	47	65*	37	35	13.38	9	9	7	3.5	2.7	3.2	1.8	2.4	2.4
17	19	20	51*	9	17	9.75	9	8	8	2.0	2.7	1.5	1.8	1.6	4.5
18	15	17	48**	17	31	20.0	7	5	5	1.7	3.2	1.6	2.5	4.6	2.5
19	18	36	50*	29	21	14.17	9	11	7	3.0	3.6	2.9	3.1	4.9	6.7
20	37	50	64*	19	21	9.0	9	9	7***	7***	6.9	7.5	6.9	6.7	4.3
21	78	88	83*	36	42	14.0	11	11	10	10***	2.3	2.0	2.5	2.3	2.3
22	29	39	60*	26	24	11.5	9	10	7***	9***	2.1	1.6	1.7	2.3	2.3
23	23	18	63	5	11	3.5	8	9	7	8***	2.0	3.3	4.4	4.4	5.7
24	54	71*	71*	25	25	12.5	8	6	6	4.0	2.7	2.7	3.2	3.2	5.7
25	29	30	61	30	37	14.0	8	7	7	2.5	7.5	6.9	5.5	5.5	2.1
26	91	90	95*	45	38	13.0	9	11	10***	7.5	3.3	3.0	3.0	3.2	2.8
27	45	45	67*	38	14	9.0	11	10	9	3.3	3.0	3.0	3.0	3.2	3.2
28	34	36	81	14	16	11.5	10	10	10	3.3	3.0	3.0	3.0	3.2	3.2
29	36	36	76	16	32	11.5	10	11	11	2.9	3.0	1.9	2.6	2.8	3.2
30	13	38	46**	28	28	9.0	11	11	11	2.9	3.0	1.9	2.6	2.8	3.2

* Ss older than 13 years, 6 months who were given a scale score equal to that of a S who was 13 years, 6 months

** Extrapolated score

*** Ss older than 15 years 11 months who were given a scale score equal to that of a S who was 15 years 11 months

a Tester forgot to record the time

Appendix C

3. Raw Data Summary Sheet for Number of Classes, Total Grade Point, Mean Grade Point, and Mean Grade Point Change for All Ss for the 1972-73 and 1973-74 School Years

Subject	Number of Classes		Total Grade Point		Mean Grade Point		Change
	1972-73	1973-74	1972-73	1973-74	1972-73	1973-74	
1	21	15	51.00	54.00	2.43	3.60	1.17
2	12	12	10.00	14.99	.83	1.25	.42
3							
4	24		11.66		.49		
5	13	12	24.00	22.00	1.85	1.83	-.02
6	19	12	46.00	12.00	2.42	1.00	-1.42
7	16	15	8.00	7.00	.50	.47	-.03
8	14	8	13.00	4.99	.93	.62	-.31
9	13	12	19.31	18.66	1.49	1.56	.07
10		16		28.66		1.79	
11							
12	22	22	27.00	46.83	1.23	2.13	.90
13	18	18		39.49		2.19	
14	18	18	4.00	8.04	.22	.45	.23
15	20		23.00		1.15		
16	9	12	8.67	18.66	.96	1.56	.60
17	22	22	42.66	56.15	1.94	2.55	.61
18							
19	14	14	43.31	46.00	3.09	3.29	.20
20							
21	14	12	18.00	6.00	1.29	.50	-.79
22							
23	22	23	14.00	12.50	.64	.54	-.10
24	8		0		0		
25	20		55.00		2.75		
26	12	12	0	0	0	0	0
27							
28	24	20	49.48	43.64	2.06	2.18	.12
29	23	24	33.81	33.83	1.47	1.41	-.06
30	16	8	14.00	9.00	.88	1.13	.25

Appendix C

4. Raw Data Summary Sheet for Number of Classes, Total Grade Point, Mean Grade Point, and Mean Grade Point Change for Only Those Classes Involving Language and Math for All Ss for the 1972-73 and 1973-74 School Years

Subject	Number of Classes		Total Grade Point		Mean Grade Point		Change
	1972-73	1973-73	1972-73	1973-74	1972-73	1973-74	
1	10	11	17.00	41.00	1.70	3.73	2.03
2	6	4	4.00	4.99	.67	1.25	.53
3							
4	10		1.66		.16		
5	6	6	2.00	8.00	.33	1.33	1.00
6	4	4	6.00	0	1.50	0	-1.50
7	4	4	2.00	3.00	.50	.75	.25
8	5	4	3.00	3.33	.50	.83	.33
9	6	6	8.66	10.66	1.44	1.78	.34
10		6		6.00		1.00	
11							
12	12	12	3.00	18.50	.25	1.34	1.29
13	10	10		20.83		2.08	
14	10	10	4.00	2.72	.40	.27	-.13
15			16.00		1.14		
16	4	4	3.67	2.33	.92	.58	-.34
17	12	10	24.00	43.64	2.00	4.36	2.36
18							
19	6	4	20.99	16.00	3.50	4.00	.50
20							
21	6	6	4.00	2.00	.67	.33	-.34
22							
23	12	11	4.00	6.00	.33	.54	.21
24	4		0		0		
25	14		37.00		2.64		
26	4	4	0	0	0	0	0
27							
28	12	10	23.83	17.32	1.98	1.73	-.25
29	12	12	18.00	13.00	1.50	1.08	-.42
30	8	2	6.00	1.00	.75	.50	-.25

Appendix C

5. Raw Data Summary Sheet for School Absences and Citizenship Ratings for the 1972-73 and 1973-74 School Years and Change for the Respective Time Period

Subjects	School Absences		Change	Citizenship Ratings		Change
	1972-73	1973-74		1972-73	1973-74	
1	24.0	9.0	15.0	3.00	2.50	-.50
2	2.0	50.0	-48.0	1.00	1.00	.00
3						
4	29.0			2.00		
5	10.0	27.0	-17.0	1.75	1.43	-.32
6	4.0	24.0	-20.0		2.00	
7	88.0	57.0	31.0	2.75	2.65	-.09
8	24.0	19.0	5.0	1.64	1.50	-.14
9	67.0	35.0	32.0			
10		8.0			2.10	
11						
12	21.5	13.0	8.5	3.00	3.00	0
13	63.0	43.0	20.0		2.00	
14	18.5	51.0	-32.5	3.00	3.00	0
15	27.0			3.00		
16	12.0	36.0	-24.0	2.00	2.00	0
17	13.0	14.5	-1.5	2.00	2.00	0
18	66.0	90.0	-24.0			
19	16.0	40.0	-24.0	1.00	1.00	0
20						
21	36.0	31.0	5.0	2.00	1.33	.67
22	145.0	180.0	35.0			
23	10.5	24.0	13.5	3.00	3.00	0
24	23.0					
25	6.5			2.00		
26	50.0	156.0	-106.0			
27						
28	28.5	11.5	17.0	2.00	2.00	0
29	44.5	16.0	28.5	2.00	3.00	-1.00
30	37.0	94.0	-57.0	2.87	2.50	-.37

Appendix C

6. Raw Data Summary Sheet for the Number of Hours of Tutoring for the Ss in the Conceptual Group and Academic Group Over the 12 Week Experimental Period; Number of Days of Youth Home Incarceration for the 213 Days Preceding Treatment (2-28-73 to 9-29-73) and the 213 Days Following Treatment (12-15-73 to 7-16-74) and Change for the Respective Time Period

Subjects	Hours of Tutoring	Youth Home Incarceration		Change
		Pre	Post	
1	20			
2	22	7	0	7
3	22			
4	9	15	0	15
5	22	29	0.5	29
6	20			
7	13	12	0	12
8	24			
9	19	7	0	7
10	20			
11	17			
12	18			
13	10	7	0	
14	24			
15	3			
16	12			
17	18	6	0	6
18	5			
19	7			
20	22			
21				
22		0.5	0.5	0
23				
24		2	0	2
25				
26				
27		29	28	-1
28				
29				
30				

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